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TRANSACTIONS

OF THE

LINNEAN SOCIETY.

VOLUME II.

MISSOURI
BOTANICAL
GARDEN.

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CONTENTS.

I. *THE History and Descriptions of four new Species of Phalæna. By the late Mr.* John Beckwith, *F. L. S.* Page 1

II. *Remarks on Scolopendra electrica, and Sc. subterranea. By* George Shaw, *M. D. F. R. S. and L. S.* — p. 7

III. *Remarks on the Abbé Wulfen's Descriptions of Lichens; published among his rare Plants of Carinthia, in Professor Jacquin's Collectanea, Vol.* II. 112. *By* James Edward Smith, *M. D. F. R. S. and P. L. S.* —— —— p. 10

IV. *Account of the Gizzard of the Shell called by Linnæus Bulla lignaria, addressed to the President. By Mr.* George Humphrey, *A. L. S.* —— —— p. 15

V. *Account of the Difference of Structure in the Flowers of six Species of Passiflora. By Mr.* James Sowerby, *A. L. S.* p. 19

VI. *Descriptions of two new British Fuci. By* Thomas Jenkinson Woodward, *Esq. F. L. S.* —— —— p. 29

VII. *An Eſſay towards an Hiſtory of the Britiſh Stellated Lycoperdons: being an Account of ſuch Species as have been found in the Neighbourhood of Bungay, in Suffolk.* *By* Thomas Jenkinſon Woodward, *Eſq. F. L. S.* —— p. 32

VIII. *A new Arrangement of Papilios, in a Letter to the Preſident.* *By Mr.* William Jones, *F. L. S.* —— p. 63

IX. *Deſcriptions of ſeveral Species of Pancratium.* *By* Richard Anthony Saliſbury, *Eſq. F. L .S.* —— p. 70

X. *Some Account of the Muſca Pumilionis of Gmelin's Edition of the Syſt. Naturæ.* *By* William Markwick, *Eſq. F. L. S. With additional Remarks by* T. Marſham, *Eſq. Sec. L. S.* p. 76

XI. *Deſcription of Paſpalum ſtoloniferum.* *By Mr.* Lewis Boſc, *F. M. L. S.* —— —— —— p. 83

XII. *Obſervations on the Structure and Oeconomy of ſome curious Species of Aranea.* *By Mr.* Dorthes, *F. M. L. S.* p. 86

XIII. *Account of the Germination and Raiſing of Ferns from the Seed.* *By Mr.* John Lindſay, *Surgeon in Jamaica. Communicated by Sir* Joſeph Banks, *Bart. P. R. S. and H. M. L. S.* —— —— p. 93

XIV. *Additional Obſervations relating to Feſtuca ſpadicea and Anthoxanthum paniculatum.* *By* James Edward Smith, *M. D. F. R. S. and P. L. S.* —— —— p. 101

XV. *Plantæ*

XV. *Plantæ Eboracenſes*; *or, A Catalogue of the more rare Plants which grow wild in the Neighbourhood of Caſtle Howard, in the North Riding of Yorkſhire, diſpoſed according to the Linnean Syſtem. By Mr.* Robert Teeſdale, *F. L. S.* p. 103

XVI. *Obſervations on the Britiſh Species of Carex. By the Rev.* Samuel Goodenough, *LL. D. F. R. S. Tr. L. S.* p. 126

XVII. *On Genera and Species of Plants which occur twice or three times, under different Names, in Profeſſor Gmelin's Edition of Linnæus's Syſtema Naturæ. By* Jonas Dryander, *M. A. Libr. R. S. and F. L. S.* —— —— p. 212

XVIII. *Remarks on Centaurea ſolſtitialis and C. melitenſis. By* James Edward Smith, *M. D. F. R. S. P. L. S.* p. 236

XIX. *Deſcription of Fucus daſyphyllus. By* Thomas Jenkinſon Woodward, *Eſq. F. L. S.* —— —— p. 239

XX. *The Characters of Two Species of Oxalis. By* Richard Anthony Saliſbury, *Eſq. F. R. S. and F. L. S.* p. 242

XXI. *Deſcription of a New Species of Warbler, called the Wood Wren, obſerved in May* 1792. *By Mr.* Thomas Lamb, *A. L. S.* —— —— —— p. 245

XXII. *Obſervations upon the Structure and Oeconomy of thoſe Inteſtinal Worms called Tæniæ. By Mr.* Anthony Carliſle, *F. L. S.* —— —— —— p. 247

XXIII. *A New Method of preſerving Fungi*, &c. *By* William Withering, *M. D. E. R. S. and F. L. S.* — p. 263

XXIV. *Ob-*

XXIV. *Objections againſt the Perceptivity of Plants, ſo far as is evinced by their external Motions, in Anſwer to Dr.* Percival's *Memoir in the Mancheſter Tranſactions. By* Robert Townſon, *Eſq. F. R. S. Edinb.* —— —— p. 267

XXV. *An Eſſay on the various Species of Sawfiſh. By Mr.* John Latham, *F. R. and A. S. S. and F. L. S.* — p. 273

XXVI. *Deſcriptions of Four New Britiſh Lichens. By the Rev.* Hugh Davies, *F. L. S.* —— —— p. 283

XXVII. *An Account of ſome Plants newly diſcovered in Scotland. By Mr.* James Dickſon, *F. L. S.* —— p. 286

XXVIII. *Remarks on the Genus Dianthus. By* James Edward Smith, *M. D. F. R. S. and P. L. S.* —— p. 292

XXIX. *The Hiſtory and Deſcription of a Minute Epiphyllous Lycoperdon, growing on the Leaves of the Anemone nemoroſa. By* Richard Pulteney, *M. D. F. R. S. S. Lond. and Edin. and F. L. S.* —— —— p. 305

XXX. *Extract of a Letter from Mr.* John Lindſay, *Surgeon in Jamaica, to Sir* Joſeph Banks, *Bart. P. R. S. and H. M. L. S. dated June* 30, 1792. —— —— p. 313

Additional Remarks, by James Edward Smith, *M. D. P. L. S.* —— —— —— p. 314

XXXI. *Deſcriptions of Three New Species of Hirudo. By the Reverend* William Kirby, *A. L. S.* —— —— p. 316

Additional Note, by George Shaw, *M. D. F. R. S. and F. L. S.* —— —— —— p. 319

XXXII. *Ad-*

XXXII. *Additional Observations on Fucus Hypoglossum, p.* 30. *By* T. J. Woodward, *Esq. F. L. S.* —— p. 321

Additional Note to the Essay on the Stellated Lycoperdons, referred to L. recolligens, at p. 58. *By the same.* —— p. 323

XXXIII. *Additional Remarks on the Wood Sandpiper, Tringa glareola. By* William Markwick, *Esq. F. L. S.* — p. 325

XXXIV. *Botanical Observations on the Flora Japonica. By* Charles Peter Thunberg, *Knight of the Order of Wasa, Professor of Botany and Medicine in the University of Upsal, F. M. L. S.* p. 326

XXXV. *Description of Sagina cerastoides, a new British Plant discovered in Scotland by Mr. James Dickson, F. L. S. By the President.* —— —— p. 343

XXXVI. *An Account of two new Genera of Plants from New South Wales, presented to the Linnean Society by Mr. Thomas Hoy, F. L. S. and Mr. John Fairbairn, F. L. S. By the President.* —— —— —— p. 346

XXXVII. Extracts *from the* Minute Book *of the Linnean Society.* —— —— —— p. 353

TRANS-

DIRECTIONS

FOR PLACING THE PLATES OF THE SECOND VOLUME.

TAB. 1. PHALÆNÆ to face page - - - 6
2. Bulla lignaria - - - - - 18
3. Paſſiflora quadrangularis & alata - - - 21
4. ——— laurifolia & cærulea - - - 24
5. ——— lunulata & minima - - - 26
6. Fucus aſparagoides - - - - 29
7. hypogloſſum - - - - 30
8. Arrangement of papilios - - - - 69
9. Pancratium maritimum - - - - 70
10. ——— amœnum - - - - 71
11. ——— fragrans - - - - 72
12. ——— ſpecioſum - - - - 73
13. ——— littorale - - - - 74
14. ——— ſtellare - - - - 74
15. Muſca pumilionis - - - - 78
16. Paſpalum ſtoloniferum - - - - 85
17. Araniæ - - - - - 91
18. Ferns - - - - - 98
19. Carex axillaris, p. 151; diviſa, p. 157, & tereti-
uſcula, p. 163 - - - - 210
20. —— ſtrigoſa, p. 169; filiformis, p. 172; & ful-
va, p. 177 - - - - 210
21. —— extenſa, p. 175; cæſpitoſa, p. 195; & ſtric-
ta, p. 196 - - - - 210
22. —— rigida, p. 193 - - - 210
23. Fucus daſyphyllus, &c. - - - - 241
24. Wood wren - - - - - 246
25. Tæniæ - - - - - - 258
26. Sawfiſh - - - - - 282
27. Priſtis cirratus - - - - 282
28. Lichens - - - - - - 284
29. Hirudo crenata: - - - - 318

TRANSACTIONS

OF THE

LINNEAN SOCIETY.

I. *The History and Descriptions of four new Species of Phalæna.*

By the late Mr. John Beckwith, F. L. S.

Read March 3, 1789.

IN the present advanced state of Entomology it is not often to be expected that much of the Natural History of new and extremely rare species of insects can be obtained. The methods which many of them take to screen themselves from observation in their first stages of life (too often successfully for the Entomologist) are not more various than they are interesting and curious. Of the Lepidoptera, that order of insects whose beauty has invited most Entomologists particularly to attend to it, many of the caterpillars feed enclosed within the stems of herbaceous plants; others in the branches or trunks of trees; a few within fruits and buds of flowers; some upon the roots of plants; others again float upon the surface of the water, between the leaves of aquatic vegetables, woven around them with inimitable art; and a much greater num-

ber than is generally ſuppoſed eſcape our notice by taking their nouriſhment only in the night. Of this kind, one of the following Caterpillars is an inſtance. And, though many feed more conſpicuouſly upon the leaves of trees and plants in the day time, yet a conſiderable number of thoſe, as if conſcious of the ſimilarity of their colour to the underſides of the leaves, and of the ſafety they derive from attaching themſelves thereto, are ſeldom to be ſeen but in that ſituation. Many others, of the family of Phalænæ Geometræ, will very frequently fix themſelves upon the trunks or branches of trees, in an almoſt erect attitude, and remain motionleſs for ſeveral hours together; and their roughneſs and colour, in general ſo nearly reſembling that of the bark, aiding the deception, a perſon not uſed to ſuch appearances, and often a good connoiſſeur, would not heſitate to pronounce them mere lifeleſs twigs, or decayed branches of the trees.

Theſe various methods of eluding our ſight, added to the uncertainty of breeding many ſpecies when procured, have prevented our being acquainted with the larvæ of the far greater part of the Lepidopterous inſects. In the courſe of ſeveral years endeavours to promote ſo deſirable an object as the aſcertaining them more generally, various obſervations upon, and drawings of larvæ, &c. were made, which produced undeſcribed Phalænæ, among which I apprehend are the four following Noctuæ.

The larva tab. 1. fig. 1. is of a pale greeniſh yellow; two rows of minute white ſpecks are placed longitudinally on each ſide: theſe, upon the pale ground colour of the caterpillar, are ſcarcely to be diſtinguiſhed at firſt ſight: the head is red, and the whole caterpillar perfectly ſmooth: it feeds upon the oak, encloſed within two or three leaves ſlightly ſpun together, and generally places itſelf in a curved poſition when at reſt, as in the figure. About the end of June it attains its full growth, and ſpins a weak web, uſually among

among the leaves, within which it produces the pupa, as at fig. 2. of a dark reddiſh brown colour, very gloſſy, ſhort, and thick, the abdomen terminating in a ſharp point. The Phalæna itſelf, fig. 3. appears, in ordinary ſeaſons *, about the ſecond week in April following: it is exceeding rare; but I met with the larvæ two ſucceſſive years in the neighbourhood of Brentwood in Eſſex, and bred them with eaſe and certainty.

Deſcr. Phal. Noctua *Chryſoceras.* Spirilinguis criſtata, antennis flavis, thorace aliſque anticis ſulphureo-olivaceis nebuloſis, poſticis albidis fuſceſcentibus.

Expanſio alarum, 1 unc. 4 lin.

Thorax antice linea tranſverſa alba. *Alæ ſuperiores* ſulphureæ nebulis olivaceis. *Stigmata* duo approximata invicem averſa nigro marginata; ſtrigæ nigræ per interiorem partem varie diſcurrunt: marginem exteriorem verſus ſtriga alba ſerrato-dentata, ad marginem ipſum ſtriga nigra repanda, ſinubus areolas albidas fovens.

It may be obſerved of theſe moths, that they differ much in the characters upon the ſuperior wings, the moſt perfect and beautiful having the yellow dentated and undulated lines, &c. very diſtinct; but in others the yellow is ſo blended with the black as nearly to obliterate all the markings, and the moth appears of a dirty olive colour with indiſtinct blackiſh clouds.

Fig. 4. is a larva which bears a great affinity to the former. The body is of the ſame pale yellow colour, and the head likewiſe red. It differs chiefly in the want of the longitudinal rows of white

* Phalænæ in general, but particularly thoſe whoſe natural time of appearance is in the ſpring, will be ſometimes produced in an early ſeaſon a month or more before their uſual time; a backward ſeaſon retarding them in the ſame proportion.

ſpots, and in a ſuperior degree of thinneſs and tranſparency of the ſkin and humours, through which the inteſtines very viſibly appear. This circumſtance renders it extremely liable to be injured in beating from the trees. Its food is the poplar, upon which I have repeatedly found it near town about the end of September. In the beginning of October it generally prepares for its transformation by encloſing itſelf between two leaves, whoſe edges it unites by a great number of pretty ſtrong threads. The Chryſalis, fig. 5. is of a reddiſh brown, and of the uſual form.

The Phalæna, fig. 6. is produced from it about the end of May or beginning of June in the next year.

Deſcr. Phal. Noctua *Gemina*. Spirilinguis criſtata, alis ſuperioribus cinereo-fuſceſcentibus, faſciis duabus ſtrigoſis maculiſque duabus niveis intermediis.

Expanſio alarum, 1 unc. 2 lin.

Baſis alarum ſuperiorum cinereo-fuſceſcens; intra medium faſcia lata e ſtrigis quatuor nigris confecta; in ipſo medio maculæ duæ niveæ, interior orbicularis, exterior ſubrotunda poſtice biloba; extra medium faſcia e ſtriis ſub tribus undulatis; in apice marginis antici lineola obliqua nigra. Alæ inferiores fuſceſcentes ſuperioribus pallidiores.

The larva, fig. 7. has the back and belly of a pale livid colour; along the middle of the back is a row of white rhomboidal ſpots, one in each ſegment; the ſides are of a dark brown, the lower extremity being edged with a white line. I have met with it near the roots of willow trees, concealed under the earth or tufts of graſs, on removing of which it is diſcovered: it aſcends theſe trees in the evening to feed upon the leaves, and returns in the morning to its place of retirement, remaining the whole of the day concealed. This conſtant practice is probably to avoid the attacks of Ichneu-

mons or other enemies. If ſo, it is not always ſucceſsful; for though I took ſeveral in the years 1785 and 1786, yet in the year 1787, out of twenty larvæ which I procured, but one Phalæna was produced, the remainder appearing to have been deſtroyed by Ichneumons, which had permitted them to enter the earth, and undergo their metamorphoſis, as I found moſt of the chryſalides dead, with their cruſtaceous coverings ſwelled and diſtorted, and a ſingle large ſilky cone within each of them. I was not fortunate enough to breed any of the Ichneumons.

Frequent opportunities occurred of obſerving that the ſame œconomy of feeding only in the night, ſubſiſted among theſe caterpillars in the cages in which they were kept for breeding, as in the night time they were always diſtributed over the leaves placed for their food; but during the day appeared to be all loſt, except one or two which were occaſionally ſeen; and this I accounted for from the cages admitting the light but faintly.

Theſe caterpillars arrived at their full growth the laſt week in May, when they changed in the earth to ſlender brown chryſalides, one of which is ſhewn at fig. 8. The moth, fig. 9, came out the end of June.

Deſcr. Phal. Noctua *Pulla.* Spirilinguis criſtata, alis deflexis ſuperioribus fuſco-ferrugineis ſubnebuloſis ſtriga alba undulata.

Expanſio alarum, 1 unc. 4 lin.

Alæ ſuperiores ex fuſco dilute ferrugineæ nigroque ſubnebuloſæ. In medio verſus marginem craſſiorem duæ maculæ: quarum interior ſubrotunda, exterior reniformis albido obſoletè cinctæ; linea alba undulata prope marginem exteriorem. Alæ inferiores cinereæ. Anus barbatus.

Fig. 10. is a larva of a beautiful green colour; through the tranſparent ſkin and humours the inteſtines are conſpicuouſly

ſpicuouſly ſeen. It is the moſt ſlender larva of a Noctua that I ever obſerved, and at firſt ſight greatly reſembles many of the Geometræ, whoſe motion likewiſe it in ſome degree imitates. I found it upon the ſallow near Brentwood on the 18th of June, and it went into the earth in about a week. The pupa I am unacquainted with.

The Phalæna, fig. 11. was bred from the above larva on the 24th of July; in its perfect ſtate it runs with great celerity in the day. It is extremely rare.

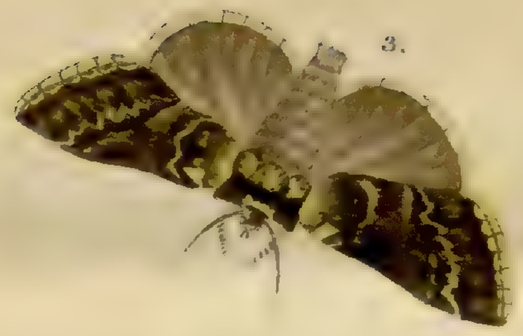
Deſcr. Phal. Noctua *Chryſogloſſa*. Spirilinguis criſtata, alis ſuperioribus griſeis ſubfalcatis ſtrigis tribus albis primoribus abbreviatis.

Expanſio alarum, 1 uncia.

Lingua flava. Alæ ſuperiores ſubfalcatæ, fuſceſcentes, ſive albidæ atomis fuſcis conſperſæ, in ipſâ baſi ſtriga albida abbreviata, paullo intervallo ſtriga albida continuata. Extra hanc duæ maculæ fuſcæ quarum interior ſubovata, exterior reniformis, albidâ lineâ cinctæ. Intra marginem exteriorem ſtriga albida, et linea alba ad marginem. Margo exterior ſtrigarum omnium ſaturatior et maculis concolor.

Alæ inferiores fuſceſcentes.

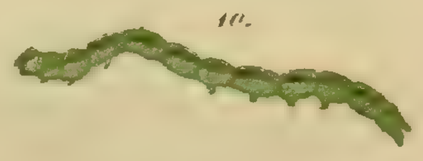
Linn. Trans. II tab. 1. p. 6.



Ph. Noct. chrysoceras.

Ph. Noct. gemina.

Ph. Noct. pulla.



Ph. Noct. chrysoglossa.

II. *Remarks on Scolopendra electrica, and Sc. ſubterranea. By George Shaw, M. D. F. R. S. and L. S.*

Read April 7, 1789.

AMONGST the Engliſh inſects of the genus *Scolopendra* there appears to me to exiſt a ſpecies which is not diſtinctly deſcribed, and I believe is generally confounded with the *Scolopendra electrica* of Linnæus, which it ſo much reſembles that it is not eaſy to give a criterion by which it may at all times be diſtinguiſhed from it. The moſt ſtriking difference, as to its external appearance, conſiſts in its being of a much lighter colour than the *Scolopendra electrica;* the *electrica* being of a full brown, or approaching to a chefnut colour, while this other ſpecies is never much deeper than a ſtraw colour. Another diſtinctive mark is, that it is narrower and thinner in proportion than the *electrica;* and though I have never accurately counted the number of feet, yet I am ſtrongly inclined to think that they are more in number than thoſe of the *electrica.* But what ſeems moſt to indicate a difference of ſpecies is the very different habitation of this inſect; for while the *Sc. electrica* is found in houſes, and amongſt wood, linen, and other ſubſtances, the ſpecies or variety I am now ſpeaking of is never found any where but at a conſiderable depth below the ſurface of the ground, and principally reſides in garden ground, in which it may be generally found about the roots of plants at moſt ſeaſons of the year, except in very froſty weather. If placed in a dry box it will ſcarce ſurvive more than a ſingle day, and frequently

quently not ſo long. On the contrary, the *electrica* may be always preſerved in this manner at leaſt a month, and frequently two or three months together, without ſeeming to loſe much of its vigour; nay, it may even be kept pretty cloſely confined between two glaſſes for many days without any danger of periſhing.

Another very curious particular belonging to the *Sc. electrica* (and which cannot be obſerved in the other ſpecies) is, that if cut in two about the middle, both parts will live and appear vigorous for a very conſiderable time; ſometimes a fortnight; but with this very extraordinary circumſtance, that the tail-part always ſurvives the head-part two or three days; ſo that the principle of vitality is much more powerful in the lower part of the creature than in the upper.

This experiment I made and frequently repeated ſeveral years ago, and till lately imagined that it had not been obſerved by any other perſon; but I lately obſerved a remark by Haller in his *Bibliotheca Anatomica*, that the circumſtance of both the cut parts living has been mentioned in a German work entitled *Unzer's Kleine Schriften*. This being a work I have never ſeen, I can only quote the very brief expreſſion of Haller, viz. "Scolopendræ diſſectæ utraque "medietas vixit:" yet there is no mention of the poſterior part ſurviving the anterior, nor is the particular ſpecies of the inſect mentioned.

I am aware that it may be objected to the idea of theſe two ſorts of *Scolopendra* being ſpecifically different, that the different habitation of the animal, and a difference in colour, are not ſufficient to conſtitute a difference of ſpecies, eſpecially as ſome animals are ſuppoſed to reſide in habitations of the greateſt poſſible difference; the *Faſciola hepatica* for inſtance, which is ſuppoſed to inhabit the waters, and yet is found in great abundance and in great vigour in the liver and gall-bladder of ſheep. It is alſo a well-known circum-

circumſtance, that the larvæ of many inſects are ſubterraneous, while the inſects in their complete ſtate inhabit the ſurface. Yet with reſpect to the two *Scolopendræ* before mentioned, I muſt ſtill think that there are ſufficient grounds for ſuppoſing a real and ſpecific difference; and in order that they may the more eaſily be diſtinguiſhed, it might not perhaps be improper to give to the ſpecies thus imperfectly deſcribed, the trivial name of *ſubterranea.*

I am by no means certain that the *Sc. ſubterranea* yields any of that phoſphoric light which prevails ſo ſtrongly in the other: ſhould this be uniformly the caſe, there is ſtill another argument in favour of a real ſpecific difference.

III. *Remarks on the Abbé Wulfen's Deſcriptions of Lichens; publiſhed among his rare Plants of Carniola, in Profeſſor Jacquin's Collectanea, Vol.* II. 112. *By James Edward Smith, M. D. F. R. S. and P. L. S.*

Read Oct. 6, 1789.

THE more eminently a naturaliſt has diſtinguiſhed himſelf by his accuracy and judgment, the more dangerous to poſterity are any errors he may commit in the ſequel of his enquiries. I hope therefore it will not appear altogether unimportant to the Linnean Society, if I lay before them a few remarks on ſome unaccountable botanical miſtakes in a paper of the juſtly celebrated Wulfen, entitled Plantæ Rariores Carinthiacæ, publiſhed by Profeſſor Jacquin in the ſecond volume of his Collectanea, in 1788. Still leſs ſurely ſhall I be in danger of cenſure for preſuming to point out defects in the works of ſuch able men, for it is only authors of authority whoſe errors are worth pointing out.

The miſtakes alluded to chiefly regard the Lichens deſcribed and figured in the volume above mentioned; and theſe I beg leave briefly to notice, taking the plants in the order in which they preſent themſelves.

No. 175. *Lichen tauricus*, p. 177,

is L. vermicularis, *Linn. fil. meth. muſc.* 37. I have found it on the alps of Switzerland.

No. 176. *L. marmoreus.* p. 178.

This plant being unknown to me, I ſhall not preſume to make any farther remarks upon it, than to obſerve in general, that a red or purple colour is often not natural to cruſtaceous Lichens, but occaſioned by the urine of ſome animal falling upon them, to which I ſuſpect the colour of *Lichen Oederi* to be owing.

No. 177. *L. corallinus.* p. 180.

This appears by the deſcription to be the true Linnean plant, although the author has not noticed the foliaceous margin ſo remarkable in this ſpecies, by which it is proved to belong to the cruſtaceous Lichens, and which no writer has yet remarked. The figure is very bad, and repreſents an imbricated Lichen.

No. 178. *L. pertuſus.* p. 181.

The plant here figured and deſcribed is the L. *ſcrupoſus* of Schreber and Dickſon, totally different from *pertuſus* in all its ſtates: indeed the figure is more like a variety of L. *parellus* which I have often found at Edinburgh, very diſtinct from both the above.

No. 179. *L. cinereus.* p. 183.

This is a ſpecies about which I could never ſatisfy myſelf. If this figure be right, it is a valuable acquiſition to botany; but I am inclined to doubt it, becauſe it more reſembles *ater* of Hudſon, and Linnæus deſcribes the margin of his *Lichen cinereus* as *black.*

No. 180. *Lichen albo-cæruleſcens.* p. 184.

This beautiful Lichen is probably new, if ſufficiently diſtinct from L. *immerſus* of Weber.

No. 181. *L. atro-albus.* p. 185.

The figure of this resembles L. *cæruleo-nigricans*, more than L. *atro-albus*, but the description does not accord well with either.

No. 182. *L. atro-virens.* p. 186.

I have the plant here described for the L. *sphæroides* of Mr. Dickson. It by no means agrees with the characters of the true *atro-virens.* The latter is generally supposed a variety of L. *geographicus*, but I know not on what grounds, nor can I quite remove the difficulty, as *atro-virens* is not in the Linnean Herbarium.

No. 183. *L. viridi ater.* p. 186.

This seems to be really new, but there is no figure of it.

No. 184. *L. rigidus*, p. 187,

is nothing else than L. *corniculatus* of Lightfoot, *radiatus* of Hudson, *tristis* of Weber. The figure is unworthy the works of a Jacquin, and far inferior to that of Dillenius or even Weber. The name given by Lightfoot is best worth retaining, and has the right of priority.

No. 185. *L. reticulatus.* p. 187.

I can scarcely agree with the ingenious author in making this specifically different from L. *lanatus*, merely because the ramuli adhere together. These kind of adhesions are common in L. *islandicus* and other species, and shew their approach to the nature of Fungi.

No. 186. *L. pustulatus.* p. 188.

About this there is no doubt or difficulty.

No.

No. 187. *L. polyphyllus.* p. 190.

Certainly not ſo, nor in any manner reſembling it, but the moſt common appearance of L. *miniatus* Linn. juſt as I have found it in Scotland and Derbyſhire, and as it is publiſhed by Mr. Dickſon in his Collection of Dried Plants.

No. 188. *L. ochroleucus.* p. 192.

We have here a good figure of L. *muralis* of Schreber and Dickſon, *ſaxicola* of Pollich. There is no reaſon why the name *muralis* ſhould be changed, although not very good, eſpecially as that of *ochroleucus* has been given with more propriety to another ſpecies by Ehrhart.

No. 189. *L. olivaceus.* p. 194.

In this the author is certainly right, and his remarks on it are very juſt.

No. 190. *L. omphalodes.* p. 196.

I am ſorry I cannot ſay the ſame of this. It is by no means the *omphalodes* of Linn. and all authors, which is nearly allied to *ſaxatilis*, and perhaps not ſpecifically diſtinct from that ſpecies. The plant here deſcribed by Mr. Wulfen is the variety of L. *ſtellaris* mentioned by Hudſon and Lightfoot; probably a diſtinct ſpecies from the common *ſtellaris*, and totally different from *olivaceus*, to which Mr. Wulfen thinks it allied.

In the quotation of Micheli he is totally wrong, and corrects Linnæus extremely mal à propos; for this author rightly quotes Micheli *tab.* 49. *f.* 2. for real L. *omphalodes* in Flora Lapponica and Flo. Suecica; and the reaſon he omitted to cite him in the Species Plantarum was that he preferred the figures of Dillenius and Vaillant, eſpecially as Micheli did not find the plant himſelf,

but

but received it from the laſt-mentioned author, and conſequently his own information is leſs original.

No. 191. *L. pulchellus.* p. 199.

This appears to be the L. *tenellus* of Weber, ſo common on trees and buſhes in England, and confounded by Linnæus with L. *ciliaris;* except that the author ſays it always grows on ſtones, and never on trees. The citation of Micheli is probably wrong, as he does not mention the ciliæ of the leaves.

The multitude of errors I have taken the liberty to notice, ought by no means to detract from the credit of this able and candid botaniſt, whoſe accuracy and care are ſo well known, that ſuch errors can only be attributed to his labouring alone in the ſtudy of theſe very difficult plants, without the helps which converſation with others would have afforded him. Of the moſt eminent botaniſts with whom it has been my fortune to converſe, ſcarcely more than three or four have attended carefully to Lichens; and the greater part, even of thoſe who have written on the ſubject, are very much miſtaken in determining the Linnean ſpecies, though aſſiſted by Dillenius's matchleſs work.

IV. *Account of the Gizzard of the Shell called by Linnæus Bulla lignaria, addreſſed to the Preſident. By Mr. George Humphrey, A. L. S.*

Read Dec. 1, 1789.

SIR,

I HAVE been credibly informed that the late celebrated Dr. Linnæus, when he firſt began his Syſtema Naturæ, intended to have taken no notice of the *Teſtacea*; and his reaſon for it was, that as the animals of the far greater part were unknown, he did not chooſe to deſcribe their mere houſes or ſhells. However, it is plain that he afterwards altered his mind; and though in his ſaid work he has inſerted only a ſhort account of the animal of each genus of the Teſtacea in his characteriſtic definition thereof, yet there is no doubt but that he would have mentioned any remarkable particulars of that of each ſpecies, if he had been acquainted with any: every addition therefore to this intereſting part of Conchology, however little, would certainly have been acceptable to that indefatigable Naturaliſt, and I preſume will be equally ſo to his admirers. To that end give me leave, Sir, to trouble you to lay before the Society bearing his name, the following notes reſpecting the animal of the Bulla genus of Teſtacea.

Some few years paſt Mrs. Le Coque, who reſided at Weymouth, ſent up to her Grace the late Ducheſs Dowager of Portland, a large ſhell of that ſpecies of *Bulla* called by Linnæus *lignaria*, together with a curious internal part, accompanied by the following note:

" I am

" I am exceeding ſorry this ſhell is broke, as I think I never " met with the ſort before: it had the fiſh in it, and I think it " is as wonderful a thing of the kind as ever I ſaw. After I had " taken it out I was endeavouring which way to preſerve it, but " found I could not ſucceed, as it was of ſuch a fleſhy ſubſtance. " On opening it I found the inſide to reſemble a fowl's; it had a " diſtinct *heart*, *liver*, and this that I have ſent, which I take to " be the *gizzard*, as your Grace will ſee by a little ſhell going into " the inſide."

The Bulla and gizzard here mentioned I purchaſed at the ſale of her Grace's Muſeum for Iſaac Swainſon, Eſq. of Frith-ſtreet, Soho; and with his permiſſion have the honour of ſubmitting them to the inſpection of the Society, together with another gizzard of the ſame kind, having the parts ſeparated; accompanied by a coloured drawing of the whole, done by Mr. Lewin; which laſt I beg may be added to the collection of the Society.

The animal of all the ſpecies of the *Bullæ* that we are acquainted with is very large, conſidering the ſize of their teſtaceous part, and but a ſmall part of it can be contained in the ſhell; Linnæus ſays it is of the limax or ſlug kind.

That the part called the gizzard is for the purpoſe of maſticating its food, may be inferred not only from the ſhell found within that ſent by Mrs. Le Coque, but alſo from an obſervation ſince made by John Smith Budgen, Eſq. a gentleman very converſant in ſhells, who informed me, that from a gizzard of an animal of this kind he took a ſmall ſhell, Bulla cylindracea of Pennant, with the animal in it.

The ſhell found in the gizzard of Mrs. Le Coque's *Bulla* is a ſmall bivalve of the *Mya* genus of Linnæus; and which alſo accompanies the other ſpecimens. It had the animal in it when taken out. On one of its valves there is the commencement of a circu-

lar

lar perforation; which circumſtance I mention, as it may poſſibly throw ſome light on the cauſe of the round holes ſo frequently met with in ſhells, particularly among the bivalves; which operation has been generally aſcribed to ſhell-fiſh of the *Purpura* kind. It is probable that the animal of the abovementioned *Bulla* is provided with ſome organ within the gizzard, for perforating ſuch ſhells as are too hard to be cruſhed by the action of the gizzard valves againſt each other, in order to come at the fiſh. The ſhells of this bivalve are thick, and ſhut cloſe. The animal was entire; and as it ſeems impoſſible for ſuch ſhells to be broken by any force of ſo ſmall an animal as that of the *Bulla* in queſtion, it is poſſible that it had begun the perforation above mentioned in order to get at the encloſed meat.

Since this diſcovery was made, it has been found that the *Bulla aperta* of Linnæus, and *Bulla patula* of Pennant, have ſimilar gizzards to that of the *Bulla lignaria*; and no doubt all the ſpecies properly belonging to this genus have like parts.

It is to be hoped, that theſe obſervations may induce ſome able anatomiſt to give ſome farther accounts of the animal of the *Bullæ* ſhells, eſpecially as the abovementioned, with other kinds, are found living on our own coaſts.

It only remains for me, Sir, to add a ſhort deſcription of the drawing, TAB. 2.

No. 1. and 2. ſhew the *Bulla lignaria* in two views, the back and the mouth.

No. 3. 4. and 5. exhibit the gizzard in three different ſites. The brown parts between the valves are partly fleſhy and partly membranaceous, and connect the valves together: a. is the ſuppoſed entrance into the gizzard: b. the part from whence the *Mya* was taken.

The three valves which compoſe the gizzard, the leaſt of which is placed between the other two, as expreſſed at No. 4. are of a nature between ſhell and bone: the two larger, which are ſimilar, are nearly flat. The ſurface of the outſide, No. 6. is ſmooth, except a large depreſſion in the middle, and gloſſy. The middle of the inſide, No. 7. riſes in proportion as the other is depreſſed, and is rough, as if intended for maſtication, which its prominency alſo favours, and it alſo appears to be hardeſt there. A yellow griſtly ſubſtance ſurrounds this part, with which it is probable the valves are moved; from whence it is finely ſtriated to the edge, which is a little ſharp.

No. 8. The leaſt valve appears like one of the others bent outwards, but ſo that the two edges do not meet, particularly at the two ends, where they are a little diſtant, forming a groove wideſt at the extremities, as ſeen at No. 4. The inſide is rough at the centre, and has the circular griſtle-like part that is in each of the other valves.

Other particulars are ſo well expreſſed in the drawing, as to need no elucidation.

It may not be amiſs to remark, that the *Bulla* is deſtitute of an operculum; and there is certainly no occaſion for one, as the far greater part of the animal is on the outſide of the ſhell, and cannot, on account of its gizzard, contract itſelf ſo as to retire within it: but as it reſides in deep water, it is perhaps as ſafe there from fiſh, crabs, and other depredators, as thoſe are who live nearer the ſhore, and barricado the mouths of their ſhells with their opercula.

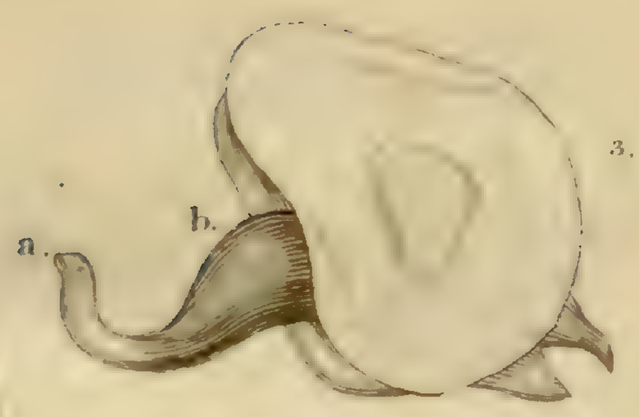
I am, Sir,

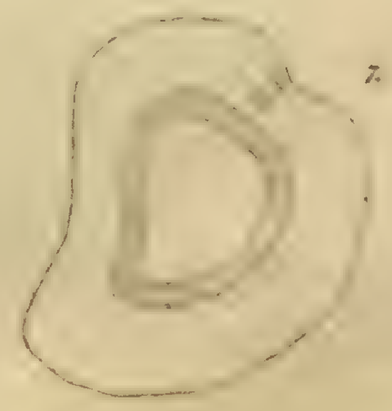
Your obliged and moſt humble ſervant,

GEORGE HUMPHREY.

Albion-ſtreet, Surry end of Black-Fryar's Bridge, 1ſt Dec. 1789.

Linn. Trans. II. tab. 2. p. 18.





Bulla lignaria Linn.

V. *Account of the Difference of Structure in the Flowers of six Species of Passiflora.* By Mr. James Sowerby, A. L. S.

Read Jan. 5, 1790.

CONSIDERING the *Passifloras* in general as one of the most beautiful tribes of plants yet known, I conceived a desire to collect drawings of them; but having been diverted from my intention by different and necessary pursuits, I have made but trifling progress. Nevertheless, from a partiality in their favour on contemplating so much variety in one flower, and the wonderful, and doubtless useful, organs of which some of them are composed, I have been led to investigate with some care such as have fallen in my way. It must be owned I had long passed over a principal beauty in the *Passiflora cærulea*, viz. the double row of horizontal, threadlike, radiated nectaries, if I may so call them. If the parts to which I allude be properly the nectary, surely many flowers in this genus have that organ in greater abundance than any other flower, as well as in greater variety: hence I was induced to pay attention to the nectaries in particular, and was much entertained with the distinguishing differences in the species. The larger species, as far as I have seen, have constantly two rows of principal radiated nectaries; the smaller commonly but one, and but half the number of divisions in the corolla, viz. only five, whereas the others have from ten to twelve. The repository for the honey also differs much in different species, and is a part very

diſtinct from thoſe above mentioned, which perhaps may ſerve as conductors, or help to ſcreen or ſecure that juice. Their particular uſes remain, as far as I know, to be inveſtigated, and probably may be among the arcana of nature. There is alſo another ſort which ſerves as an operculum under various forms, ſometimes plaited, or plaited and fringed, beſides a kind of imperfect rays in different ſituations and ſhapes, which have not yet been noticed, and might afford good ſpecific diſtinctions. Even Profeſſor Jacquin has left his *P. minima* undetermined for want of the fructification, which I preſume might have perfectly ſettled it; for I have a ſpecimen (which I cannot get poſitively determined) that reſembles it in general appearance, with a plaited ruffle between the germen and the filaments, which I have not yet ſeen in any other *Paſſiflora*; but it cannot from the figure be known whether his *minima* has this ruffle or not.

Perhaps I ſhould not have been thus particular, if there had not been ſo much difficulty in finding a character to diſtinguiſh the *quadrangularis* from the *alata*. It is well known that ſome good gardeners and botaniſts did not know the differences, and even thought them one and the ſame plant. They are certainly very much alike as to general appearance before bloſſoming, excepting the leaves in the *quadrangularis*, which have generally twice as many ſide veins, by which it is diſtinguiſhed in the Hortus Kewenſis; yet who that has not ſeen both can with certainty determine them? The flower-bud even at a diſtance will diſtinguiſh them pretty eaſily, the *quadrangularis* being rather compreſſed and never oblong, as that of the *alata* always is; the former being alſo deſtitute of awns: upon a nearer inſpection the difference is more obvious, and I will endeavour to make it clearly underſtood.

I was once told that the *quadrangularis* had the narroweſt leaves. I have ſeen it in different plants and places with narrower and

Linn. Trans. II. *tab.* 3. *f.* 21.

a. *L. quadrangularis* Linn.

b. — *alata*.

broader leaves than the *alata*. In general, the glands on the petioles are said to be six in the *quadrangularis*, which is sometimes true; but it is not constant, and I have seen six in the *alata*, seemingly by chance.

The peduncle affords a most certain distinction, with which I therefore begin my description of the characters of these and two or three others: in the mean time it may be observed, that the colour of the plant will not distinguish them; nor can the colour of their flowers, though they differ in this respect, be allowed to form a decisive distinction.

Passiflora quadrangularis. *Linn.* Tab. 3. fig. a.

The *quadrangularis* is perhaps the largest and most beautiful of the *Passifloras*, apparently containing the greatest number of parts, which I will endeavour, with the help of a drawn dissection, to describe under the following heads:

1. Peduncle, or	General footstalk of the fructification.
2. Involucrum, or	Calyx.
3. Pedicle, or	Flower stalk.
4. Petals,	Or rather segments of the corolla.
5. Principal rays,	Radiated nectaries.
6. Imperfect rays,	Small, commonly irregular, protuberances.
7. Imperfect operculum,	Cover to an anti-nectary.
8. Operculum,	——— the nectary.
9. Nectary,	Which contains the honey.

1. Peduncle	Triangular.
2. Involucrum	Of three large, concave, oval leaves, serrated towards the base.

3. Pedicle

3. Pedicle	Cylindrical, rather more ſlender at the inſertion into the concave baſe of the flower.
4. Petals	Ten or twelve, the outer five or ſix thick and ſomewhat ſpongy, a little concave, broad, ending obtuſely and without awns, the inner five or ſix thinner and ſmaller.
5. Principal rays	Two rows cloſe to each other, alike, awl-ſhaped and ſtanding perpendicularly, or nearly at right angles with the petals, which they exceed in length.
6. Imperfect rays	Four or five rows of irregularly-ſituated protuberances, nearly conical, very ſmall, on an inclined or deſcending plane.
7. Imperfect operculum*	Horizontal, partly divided into rays, which by their tips reſt on a thickened part of the column ſupporting the fructification.
8. Operculum	Horizontal and flattiſh at the end, which is edged with two rows of little imperfect or irregular teeth, reſting on the column.
9. Nectary	Round the concave baſe of the corolla, with a protuberating half partition on the ſide fartheſt from the column.

* This ſeems one part more than in any other Paſſiflora.

Paſſiflora

Passiflora alata, *Ait. Hort. Kew. V.* 3. 306, Tab. 3. fig. b.

is very like the former at first sight: the open flower has also a general resemblance, till we come to examine and make comparison, when I presume we shall find sufficient distinctions.

1. Peduncle	Cylindrical.
2. Involucrum	Three divisions, small, lanceolate, with glandular serratures.
3. Pedicle	Thickest at the insertion into the convex base of the flower.
4. Petals	The outer five or six oblong with an awn, the inner longer.
5. Principal rays	The outer thinnest and shortest.
6. Imperfect rays	A double row; below and distinct from them, a single row.
7. Imperfect operculum	Wanting.
8. Operculum	Partly horizontal and partly turning up to the column, then folding backward down again embraces the column *.
9. Nectary	Round the column †, confined by the base of the flower.

* This is so connected with the column that it appears inseparable, but is not joined to it.

† The column comes to the bottom of the nectary, which is not the case in the *quadrangularis*.

Passiflora

Paſſiflora laurifolia. *Linn.* TAB. 4. fig. c.

This perhaps is ſufficiently known, and diſtinguiſhed by its general appearance; yet it is ſo remarkable in many particulars, that I could not leave it unnoticed: its beauty alſo ſeems to demand attention.

1. Peduncle	The lower part cylindrical, becoming triangular at the inſertion of the involucra.
2. Involucrum	Three large, concave, obovate leaves, ſerrated towards their extremities with large glands, ending in two or three ſimple ſerratures.
3. Pedicle	Almoſt conical, narrowing into the deep baſe of the flower.
4. Petals	Six outer lanceolate with an awn, the inner ſmaller.
5. Principal rays	Two ſets, the outer ſhorteſt, ſpreading diagonally, baſe cylindrical, apex abrupt and irregular, flattiſh; the inner nearer upright, ſome a little clavated, others bluntly awl-ſhaped*.
6. Imperfect rays	Two or three rows irregularly ſituated.
7. Imperfect operculum	None.
8. Operculum	An horizontal plane, touching the baſe of the column, which confines it by ſpreading a little over the edge.
9. Nectary	Below the baſe of the column, round the concave baſe of the flower.

* This ſhews the double row of nectariferous rays plainly.

Paſſiflora

c.

d.

c. *P. laurifolia* Linn.
d. — *variolosa* ejusd.

Passiflora cærulea, *Linn.* TAB. 4, fig. d.

however common, is very curious in its construction, differing in many particulars from all that I have seen. This beautiful flower is generally esteemed; and, if we examine the parts of which it is composed, it will surely add to our admiration.

1. Peduncle	Cylindrical, swelling a little at the base.
2. Involucrum	Three ovate entire leaves, a little concave.
3. Pedicle	Cylindrical, thickening at each end.
4. Petals	The outer five or six a little fleshy, oblong, rather obtuse; inner narrower and thinner, about the same length.
5. Principal rays	Two rows, horizontal, threadlike, a little pointed, nearly alike, under each other.
6. Imperfect rays	One regular row, with roundish heads, on little footstalks, standing erect on an horizontal elevated plane at the base of the principal rays: within these imperfect rays are a very different set, entire at the insertion, divided into threads about half way down, and inclining against the column. On the under side is a protuberance which catches the margin of the operculum.
7. Imperfect operculum	None.
8. Operculum	Spreading from the column under the aforesaid rays.
9. Nectary	Round the base of the column, with a thick protuberance* round the side of the lower part of the flower, on which rests the operculum, and which almost divides it into two cells.

* This protuberance seems to form an antichamber to the nectary.

Paſſiflora lunulata. *Smith, Ic. Pict.* t. 1. TAB. 5, fig. e.

This is a much ſmaller flower than thoſe already deſcribed, and is remarkably different in having but one row of principal rays, very different alſo in their form, which is quadrangular. The operculum or cover of the nectary is very different, being curiouſly plaited; and this is a common caſe with the ſtill ſmaller ones. But I proceed to the different parts, continuing the former order; and as it has fewer in number, we ſhall of courſe find which are wanting, as well as the variation in thoſe which it poſſeſſes.

1. Peduncle	Cylindrical.
2. Involucrum	Three very ſmall, lanceolate, and entire leaves.
3. Pedicle	Cylindrical, thickeſt at the inſertion into the flattiſh baſe of the flower.
4. Petals	Generally ten, the outer ovate, rather lanced, the inner ſhorter.
5. Principal rays	One row, ſpreading, quadrangular, and thinneſt at each end.
6. Imperfect rays	One row, regular and clubbed.
7. Imperfect operculum	None.
8. Operculum	Regular, and plaited.
9. Nectary	Round the bottom of the flower neareſt the outer part, confined by a protuberating or thickened bank, ariſing from the baſe of the flower, gradually deſcending round the column, and making a trench about it.

Paſſiflora

c. *P. cumulata* Sm.

f — *mentana* Linn.

Paſſiflora minima. *Linn.* TAB. 5, fig. f.

This has been ſuppoſed the ſmalleſt of the tribe, whence its name, though there are others nearly if not quite as ſmall: it is however very pleaſing to ſee how perfect the parts of fructification are, and how nearly they reſemble each other, inſomuch that the ſpecies ſeem not yet perfectly diſtinguiſhed; though I preſume, when carefully examined, they will be as diſtinguiſhable as the *quadrangularis* and *alata*. I have not ſeen many; but among what I have ſeen, they are in a ſimilar predicament with regard to the ſtalk and foliage. In this I have ſome reaſon to think that the ruffle under the germ (10) will make it diſtinct, and perhaps the fringed edge of the operculum may aſſiſt: in other reſpects two or three ſpecies of the ſmall ſorts ſeem to be exactly the ſame, or not to be eaſily known from each other. I ſhould have obſerved, that they are many of them deſtitute of the involucrum, in thoſe that I have ſeen, though there is a joint between the peduncle and pedicle where we ſhould naturally expect it: they alſo have but five petals, conſequently have not any thing that ſerves as a calyx: but to proceed to the nectaries, &c.

1. Peduncle	Cylindrical.
2. Involucrum	None.
3. Pedicle	Cylindrical, curved a little, thickeſt at the flat baſe of the flower.
4. Petals	Five, lanceolate, turned back.
5. Principal rays	Cylindrical, ſpreading, curved back.
6. Imperfect rays	Moſtly clubbed, ſometimes bifid.
7. Imperfect operculum	None.
8. Operculum	Plaited and fringed at the edge.
9. Nectary	The ſame as the laſt, except that at the ridge of the protuberating bank are ſome ſmall, regular, roundiſh glands, or imperfect rays, if I may ſo call them.

It may not be amiſs to obſerve here, that, in addition to the various forms in this genus, we are generally captivated with the beautiful diſplay of their colours. In the *quadrangularis*, we cannot but admire the principal rays, from the colour being ſo regularly diſpoſed in rings round them*, which is more diſtinct in the *alata*, making it vie with the former in beauty; in the *laurifolia* it is ſimilar; it adds much alſo to the beauty of the *cærulea*. The ſmaller ones in general have yellow rays. The different parts are commonly ſpotted, or otherwiſe coloured, in moſt of them.

* Theſe rings are red towards the bottom of the rays, alternately relieved with white, upwards becoming purple, terminating in a rich ultramarine or ſmalt blue towards their tops; this blue is the more like ſmalt, being partly powder, which if duſted on white paper we might miſtake for ſuch.

VI. *Deſcrip-*

VI. *Deſcriptions of two new Britiſh Fuci. By Thomas Jenkinſon Woodward, Eſq. F. L. S.*

Read May 4, 1790.

1. Fucus *aſparagoides*, Tab. 6.

—CAULE tereti ramoſiſſimâ, foliis ſetaceis, fructificationibus globoſis pedunculatis alternatim oppoſitifoliis.

The frons is extremely tender, of a bright red colour, very much branched, and appears to be about ſix inches high; but whether the few ſpecimens hitherto found are entire plants, or branches only, cannot be clearly aſcertained. The ſtem and branches are round, the latter appearing inclined to an alternate order. The leaves are ſetaceous, red, or greeniſh, ſcarcely thicker than a hair.

The fructification conſiſts of globular veſicles, or capſules, the ſize of the ſeeds of poppy, ſupported on ſhort fruit-ſtalks, equal in length to the capſule; and the whole one-third of the length of the leaves.

This ſpecies may be placed in the Syſtema Vegetabilium in the ſixth ſubdiviſion of Mr. Hudſon (fronde tereti) next to Fucus pedunculatus.

This beautiful plant was found by Mr. Wigg, an Aſſociate of this Society, among the rejectamenta left by the receſs of the tide on the beach at North Yarmouth, and does not appear to have been figured or deſcribed by any author.

2. FUCUS *Hypogloſſum*, TAB. 7.

—— Caule alato ramoſiſſimo, foliis lineari-lanceolatis integerrimis coſtâ proliferis.

The frons is membranaceous, extremely thin, bright red, about two or three inches high; divided immediately from the root into numerous branches, growing without order, and winged on each ſide with a thin membrane. The leaves are linear-lanceolate, very entire, ſeſſile or on very ſhort footſtalks, growing without order, and ariſing from the nerve, which runs through every part of the frons: from the nerves of theſe leaves ariſe others proliferous, from two to ſix on each leaf, and from theſe again others ſtill ſmaller; the extreme ones lanceolate.

The fructification appears to be dioecious—The male conſiſting of veſicles, the ſize of the ſeeds of muſtard, of a much deeper red colour than the frons, ſituated on the nerve near the extremity of the leaves—Female, numerous very minute grains ſcattered near the nerve on each ſide of the leaf.

Such is the appearance, if we are to conſider the fructification of theſe plants as dioecious; but as this is a matter of great doubt, it is poſſible theſe different appearances may be accounted for by ſuppoſing that the red veſicles are real capſules replete with ſeeds; and that the granular appearance proceeds from the capſules having burſt, and diſcharged their ſeeds, which adhere to the ſurface of the frons, until that decaying, they are depoſited in the place proper for their vegetation. Upon this ſuppoſition, the capſules are of courſe deciduous, and diſappear like the ſeed-veſſels of other known plants.

This ſpecies may be placed in the Syſtema Vegetabilium next to Fucus alatus in Mr. Hudſon's third ſubdiviſion, Alati, f. fronde plana, ſtipite medium folium percurrente.

A ſpecimen of this elegant plant is preſerved in the Herbarium of Sir Joſeph Banks, and has been by the late Dr. Solander named as above mentioned; but his papers on the genus Fucus being unfortunately loſt, it is unknown whence it was procured. Some time ſince it was found by Mr. Wigg amongſt other rejectamenta on the beach at Yarmouth, and from him I was favoured with ſpecimens in fructification; it was afterwards found by Mr. Crowe, F. L. S. at Cromer in Norfolk, growing on the rocks; and it has alſo been found by the Rev. Dr. Goodenough in various places on the ſouthern coaſt of England.

VII. *An*

VII. *An Eſſay towards an Hiſtory of the Britiſh Stellated Lycoperdons: being an Account of ſuch Species as have been found in the Neighbourhood of Bungay, in Suffolk. By Thomas Jenkinſon Woodward, Eſq. F. L. S.*

Read April 5, 1791.

Introduction.

THE Stellated Lycoperdons are undoubtedly to be conſidered as ſome of the moſt curious plants in the whole order of Fungi, both as to their external appearance, and their mode of vegetation. And as the author of this Eſſay has been in the habit of making obſervations upon them for ſeveral years, and has had an opportunity of thoroughly examining them in all the ſtages of their growth; the ſtellatum Linn. and its ſuppoſed varieties being very common, and the other ſpecies by no means uncommon in this neighbourhood; he thinks an account of his obſervations may not be unacceptable to the Linnean Society: the more eſpecially as he hopes to be able to throw ſome new light upon the ſubject of theſe curious, and, in general, ſcarce plants; and to correct ſome errors which have been made public relating to them.

1. It appears very extraordinary that theſe plants ſhould have been totally overlooked by the older authors, no notice being taken of any of them in Bauhin's Pinax; though the common puff-ball (Lycoperdon boviſta Linn.) is there mentioned. Tournefort, Inſt. R. H. 563, mentions one ſpecies, quoted from Boccone's Muſeum, and has figured it t. 331; but this figure repreſents an old and decayed

decayed ſpecimen, the head being irregularly torn and broken. Ray, *Syn. ed. 2da, app.* alſo deſcribes one ſpecies, found by Doody 1695; and in *ed. 3tia,* two ſpecies. Of theſe, one is the common Lycoperdon ſtellatum, of which Dillenius has there added a fig. t. 1. f. 1. and the other is referred to the plant of the 2d edit. and to the fig. of Tournefort before mentioned; but this is deſcribed by Ray, p. 28, *coli inſtar perforatus*, which does not at all agree with the figure of Tournefort, and ſeems too remarkable a circumſtance not to have been noticed in the Inſt. ſhort as the characters there given are. Micheli, *Nov. pl. gen. p.* 220, has enumerated, and has figured, t. 100, five ſpecies, under the expreſſive generic name Geaſter. Three of theſe are referred, but doubtfully, to the authors before mentioned; and all of them ſeem reducible to Lycoperdon ſtellatum Linn. or to the ſuppoſed varieties of that ſpecies. Moriſon, *Hiſt. Oxon. tom.* 3. *p.* 641, mentions the ſtellatum, but this is quoted from R. Syn. and not given on his own authority.

2. The firſt mention of the ſpecies ſince called by Mr. Hudſon Lycoperdon fornicatum, appears to have been under the fanciful name Anthropomorphus, by Sterbeck, *Theatr. fung.* and Seger, *Eph. nat. cur.* where a cluſter is figured, with human faces drawn on the heads! Which of theſe authors was the original, and which the copier of this abſurdity, is hardly worth enquiring; but as Sterbeck's book was publiſhed in 1675, and the *Eph. nat. cur.* began in 1690, it moſt probably belongs to the former. Mor. *Hiſt. Ox. tom.* 3. *p.* 641, mentions the Anthropomorphus, and its authors, but it is only to expreſs his admiration at the abſurdity. Seg. *Eph. nat. cur. ann.* 4. two years after the firſt, gives a tolerably good figure of Lyc. fornicatum, a ſolitary ſpecimen. The firſt notice of this plant by any Britiſh author is in the Phil. Tranſ. *vol.* xliii, *p.* 234, where an extremely good figure and an account are given by the late Sir Wm. Watſon. After this an excellent repreſentation was given by

Blackſtone, *Spec. botan. p.* 24. *t.* 2. The firſt mention made by Linnæus of the Lycoperdon ſtellatum appears to be in Hort. Cliff. ann. 1737, after which it is mentioned in Fl. Suec. and Sp. pl.; but in the lateſt editions of the works of this illuſtrious author no notice is taken of any other ſimilar ſpecies. It is from this probable, that, if any other had fallen under his obſervation, he conſidered them as varieties of the ſtellatum not worth noticing; it being well known that this order of plants obtained but a very ſmall ſhare of his attention. Haller *Hiſt. Stirp. Helv. tom.* 3. 2174, quotes Linnæus's Lyc. ſtell. and has referred to Watſon Phil. Tranſ. and Blackſtone Sp. bot. for (what he conſiders as) a ſlight variety of it; but informs us that he had never ſeen this plant. He alſo refers to *Eph. nat. cur.* for Anthropomorphus; but he has quoted the ſame work *ann.* 4. *obſ.* 90. for ſtellatum, which he could not have done had he actually conſulted it before he had made his reference.

3. Other more recent authors* muſt be paſſed over to come to our ingenious countryman Hudſon, who deſerves the warmeſt thanks of all Engliſh botaniſts, for having firſt completed an Engliſh Flora, in which he has with admirable ſagacity adapted the Synopſis of our immortal Ray to the Syſtem of the illuſtrious Linnæus; a work in which the errors are ſo few, that, inſtead of cavilling at them, it muſt be matter of ſurpriſe, to all ſuch as are competent to judge of the difficulty of the undertaking, that they are not much more numerous. This author, in his firſt edit. 1764, has enumerated, along with the other ſpecies of the genus Lycoperdon, two which are ſtellated; viz. the ſtellatum Linn. to

* It may be worth obſerving, that Lightfoot, Fl. Scot. 1068, takes notice that the Lyc. ſtell. Linn. had not then been found in Scotland; but that it probably would, as it was found in Sweden, which was farther north. This opinion has been ſince verified, as it was found near Edinburgh by our Preſident, ann. 1782.

which

which he has quoted the ſpecific character given in Sp. pl.; and the plant mentioned in the Phil. Tranſ. and by Blackſtone, to which he has given the expreſſive trivial name of fornicatum, and has adapted to it a ſpecific character which clearly diſtinguiſhes it from the other ſpecies. In this edition no other authors are referred to for this plant, but thoſe juſt mentioned; but in ed. 2da, 1778, the figures of Batarra and Schæffer are quoted, and an additional place of growth is mentioned from Mr. Toſield.

4. The two ſpecies, Lycoperdon ſtellatum and fornicatum, as characteriſed by Linn. and Hudſ. were conſidered by all Britiſh botaniſts as clearly diſtinguiſhed and pointed out, till the publication of a pamphlet a few years ſince* by Mr. Charles Bryant, of Norwich, entitled, 'An Hiſtorical Account of two Lycoperdons.' This work has met with many admirers, even amongſt botaniſts of eminence, but who have not had an opportunity of examining theſe plants in their native places of growth, where only, as the author juſtly obſerves, '*an accurate acquaintance with their mode of vegetation and different characters is to be obtained;*' and have conſequently been miſled by the ſpecious arguments and deciſive ſtyle of this publication. But though I object to the work, I am ready to do the author the juſtice of declaring, that I know him to be an indefatigable and, in moſt inſtances, an accurate obſerver and inveſtigator of botanical ſubjects; and am confident, that he had no other view in this treatiſe, than that of communicating to the world ſuch obſervations as he himſelf was convinced were juſt, and conſequently uſeful in aſcertaining ſome doubtful and little-known plants. I have nevertheleſs but little doubt that it will be made appear, that theſe ſpecies, Lycoperdon ſtellatum and fornicatum, as characteriſed by Hudſon, are as clearly diſtinct as any

* It was printed at Norwich, but has not the date of the year.

two ſpecies can be; and that Mr. Bryant has totally confounded what he meant to elucidate. This has happened from his forming a theory for himſelf, and then torturing the account of the different ſpecimens he has met with, to make them accord with this theory.

5. It has been obſerved before, that Linnæus mentions but one plant of this kind, to which he has given the appoſite trivial name of ſtellatum; and has characteriſed it in the following words:

Lycoperdon ſtellatum—*Volva multifida patente, capitulo glabro: ore acuminato dentato.* Sp. pl. 1653.—Fl. Suec. No. 1277.

To this Hudſon in his Fl. Ang. added another, under the name of fornicatum, which he has thus characteriſed.

Lycoperdon fornicatum—*Volva quadrifida fornicata, capitulo glabro: ore obtuſo ciliato.* Fl. Ang. ed. 1ma, 502. ed. 2da, 644.

This perfectly diſtinguiſhes it from the ſtellatum of Linnæus, without the neceſſity of making any alteration in the ſpecific character of that plant; a circumſtance which very frequently becomes neceſſary when any new ſpecies is introduced into a genus. It is to be obſerved, that no notice is taken of the pedunculated head; this being at that time unneceſſary, as Dillenius's figure of ſtellatum, R. Syn. ed. 3tia, and the figures of fornicatum referred to in Fl. Ang. repreſent the plants with peduncles.

6. Mr. Bryant, diſſatisfied with this arrangement, from having met with a ſtellated Lycoperdon having a ſeſſile head, was immediately impreſſed with an idea, that this circumſtance was the only proper one to form a ſpecific diſtinction (p. 10). He therefore directly concluded, that all ſpecimens which had the head ſupported on a peduncle, muſt form one ſpecies; and all thoſe in which the head was ſeſſile, another. And as it was abſolutely impoſſible,

that more than two ſpecies of ſtellated Lycoperdons could exiſt, he directly arranged all which he met with under one or the other of theſe ſpecies. The fornicatum of Hudſon happening, unfortunately for this theory, to have the head ſupported on a peduncle, as well as the plant figured in R. Syn.; this difficulty could no otherwiſe be diſpoſed of, than by making that plant, notwithſtanding its totally different appearance and habit, a variety of his new-formed ſpecies of fornicatum. But as the ſpecific characters of Linnæus and Hudſon, though he thought proper to retain the names, would not by any means ſuit this diſpoſition, he was under the neceſſity of forming new ones, which he has done as follows:

Lycoperdon ſtellatum—*Radice ſubcampanulata*, volva multifida patente; tunica exteriori tenui fragili, capitulo albido ſeſſili: ore lacerato.* Bryant's Hiſt. Acc. &c. p. 14.

To this are quoted as ſynonyms, *Scop. fl. carn.* 1. p. 63. n. 2. (a) —*Hall. Hiſt.* n. 2174.—*Buxb. cent.* 2. 45. *t.* 49. f. 3.

Lycoperdon fornicatum—*Radice fibroſa*, volva multifida fornicata, tunica exteriori filamentoſa, capitulo nigricante pedunculato.* Br. Hiſt. Acc. &c. p. 14.

quadrifidum—B.—*volva quadrifida.*

The

* Mr. B. has introduced the roots to form part of his ſpecific characters, and he may be right in his deſcription of the campanulated root of *his* ſtellatum, though I have never ſeen any other roots than ſuch as were fuſiform, terminated by a few fibres; and a root broken in the ground would neceſſarily put on ſomewhat of the appearance which he deſcribes. Perſons converſant with ſea plants know that ſuch roots are common amongſt the fuci; but they alſo know that the moſt received opinion is, that the roots of theſe plants are no more than fulcra, or points of ſupport; and that the plants do not derive any nouriſhment by their means. We can have no doubt but the roots of theſe Lycoperdons are deſigned to afford nouriſhment to the plant, whilſt in a growing ſtate; though from the peculiar mode of vegetation, they are loſt as ſoon as the plants arrive at maturity,

The ſynonyms are, *Scop. fl. carn.* 1. p. 64. (b) accedit—*Gled. Fung.* p. 152. *n.* v. *var.* a.——*R. Syn.* 27. t. 1. f. 1.——Neither Linnæus nor Hudſon is quoted, though undoubtedly their ſpecies were ſuppoſed to belong to one or the other, and Hudſon's fornicatum is acknowledged to be his (B.) quadrifidum.

7. Let any botaniſt compare the conciſe, deſcriptive, and diſcriminating characters, by Linnæus and Hudſon before mentioned, with theſe prolix, vague, and indeciſive characters * of Mr. Bryant; and determine whether it be poſſible to miſtake the plants pointed out by the former, or to diſtinguiſh thoſe meant by the latter. But Mr. Bryant ſays, the rays of the ſtellatum ſplit into an indeterminate number of ſegments, and therefore it is an improper ſpecific diſtinction: and this would certainly have great weight, if all the other ſpecies did the ſame; but it is expreſsly contraſted with the fornicatum, where the rays are deſcribed quadrifid, and therefore is highly proper. Again, he ſays, the diſtinctions '*ore acuminato dentato*,' turity, when they no longer want their aſſiſtance. It is difficult to conceive how any nouriſhment can be derived by a root of the kind Mr. B. ſuppoſes; and I do not know that any analogy from any other part of the vegetable kingdom can ſupport this idea. At any rate, the philoſophy of botany inſtructs us not to form ſpecific characters from roots, unleſs others are not to be found; but ſuch is not the caſe here; and from the peculiar circumſtances, the roots of theſe plants are particularly inadmiſſible.

* Excluſive of the impropriety of the roots being made uſe of for ſpecific characters, the outer coats are not eaſily to be examined when the plants are expanded. The diſtinctions, '*capitulo albido*,' and '*capitulo nigricante*,' are not founded in fact; as the heads both of Ray's plant and Hudſon's fornicatum, the fornicatum and B. quadriſidum of Bryant, are whitiſh when freſhly opened; and the head of B. only turns blackiſh in a ſhort time; the head of Ray's plant or Bryant's fornicatum remains whitiſh or grey. He has formed his ſpecific character therefore not from his ſpecies, but his variety. When we come to explain what Mr. Bryant's ſtellatum really is, the reaſon for his adopting theſe diſtinctions will be ſeen.

dentato,' and '*ore obtuſo ciliato*,' are futile (p.13); becauſe the appearances of the mouth, and its teeth or ciliæ, vary according to the age and ſtages of decay of the plant. This would alſo have weight, were it conſiſtent with fact; but the real truth is, that the ciliæ ſurrounding the mouth of ſtellatum Linn. whether opening to diſcharge the duſt or not, have always a degree of convergency, and conſequently ſomewhat of an acuminated appearance; though this is much more evident in ſome varieties than in others, as in ſome theſe ciliæ form a ſharp cone*, and in others, one ſo blunt as to be nearly flat. The fornicatum of Hudſon on the contrary, when full grown, has always the mouth open, and the ciliæ ſurrounding it forming a ſhort cylinder; and when advanced in age, theſe ciliæ are ſometimes even reflected.

8. From theſe conſiderations, it is aſſerted by Mr. Bryant, that Lyc. fornicatum of Hudſon is nothing more than an accidental and ſlight variety of the plant figured in R. Syn.; and that the lower volva, or bag as it is called, is never ſeen but when the plant is in a ſtate of decay, p. 36. This he attributes to the ſeparation of the thin outer coat from decay, and from graſs, moſs, or mould, inſinuating itſelf ſo as to cauſe it to fall from the other, and form the bag, p. 27. And again, p. 28. '*by the ſun and drying winds getting* '*in, and cauſing the two ſkins to flake from each other*,' and mould conſequently getting between them. In the ſame vague and confuſed

* A variety of ſtellatum Linn. and Hudſon, figured in Mr. B.'s plate f. 20, is a remarkable inſtance of this; but this is one which Mr. B. calls fornicatum; and it is to be obſerved here, and every where elſe, where the fornicatum is mentioned by that author, that it is his own ſpecies which he means, viz. the plant figured in R. Syn. and therefore here, and wherever he is endeavouring to invalidate the ſpecific character of Hudſon's fornicatum, he is deſcribing one plant by another; and this unattended to has been the cauſe of the confuſion his pamphlet has occaſioned. It is not to be wondered at, that he ſhould call the diſtinctions of the mouth futile, when his ſpecies fornicatum includes plants having the ciliæ forming a cone, and others where they form a cylinder.

manner

manner is the arched appearance of the rays accounted for; '*by* '*the fleſhy coat which is very thick upon the ſhoulders, as ſoon as it begins* '*to ſhrink, preſſing ſo forcibly upon the rays as to cauſe them to contract in* '*an arched direction.*' P. 27. But ſo far is this from being the fact, that this thick coat, in all the other ſpecies as well as in this, is deſtitute of any ſuch force at all; and if the plant be left undiſturbed, as ſoon as it begins to ſhrink, cracks, and peels off, or, if it remain on, dries to a mere thin cruſt; which proves its nature to be too moiſt and ſucculent to poſſeſs any elaſticity whatſoever. It will beſides be ſhewn hereafter, that, if the rays of this plant contract at all, it is in breadth, and that at the ſame time they increaſe in length; and it would be very difficult to conceive how this elaſtic force (if any ſuch there were) or preſſure ſhould act ſo as to produce this double effect. If the freſhly-opened plant of the ſtellatum Linn. and Hudſ. be taken from its native place, and carried into a dry room, the thick coat will dry upon the rays without peeling off; and in this caſe it does indeed ſomewhat contract them, but this merely from its ſhrinking. When this happens, it is ſo far from acting to occaſion an arched appearance, that it only increaſes any tendency the rays may have had, from ſituation, to contract irregularly; inſtead of being incurved, as thoſe of ſtellatum always become in age, and after loſing this thick coat, if free and unconſtrained. This ſpongy coat in the recently-opened plant entirely hides the peduncle, and the head appears perfectly ſeſſile; and this appearance ſometimes continues when the plant is immediately removed from its place of growth, and ſuffered to dry very ſlowly. This may perhaps account for ſo many authors having deſcribed the ſtellatum with a ſeſſile head; and the figures of Schæffer, t. 182, ſeem to anſwer to this, they being evidently taken from plants juſt opened. That ſuch is the fact is very likely, as very few of the deſcriptions or figures of theſe authors accord perfectly with the

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Lycoperdon hereafter to be deſcribed, which has really a ſeſſile head.

9. That Mr. Bryant's method of accounting for the double volva, and arched appearance of the rays of fornicatum of Hudſon (to ſay nothing of the improbability, or nearly impoſſibility, of a fixed and permanent effect, proceeding from vague and accidental cauſes), is merely conjecture, and not founded on actual obſervation or ſolid argument, every botaniſt who has been in the habit of obſerving plants of the order of Fungi muſt readily allow; and if they recur to the pamphlet itſelf, they will ſee that the obſervations and arguments are not miſtated. If therefore it ſhall be made to appear, that, ſo far from being cauſed by age or decay, the appearance of this plant, as to the principal facts, is the ſame throughout all its ſtages; and that it is ſubject to as little variation as almoſt any other plant, and to much leſs than by far the greater number of this order of vegetables—if it ſhall be demonſtrated, that the peculiar appearances cannot originate from the cauſes aſſigned, no doubt will remain as to the propriety of Hudſon's arrangement; and his ſpecies of Lyc. fornicatum will be fully re-eſtabliſhed in the rank from which it has been endeavoured to be degraded.

10. Mr. Bryant aſks, p. 39. '*If the quadrifidum be a diſtinct ſpecies, how comes it to paſs that it is ſo very* * *ſcarce; when the head of a ſingle plant (if the duſt be allowed to be the ſeed) is ſufficient to produce thouſands; and yet a perſon who ſearches on purpoſe, where theſe*

* How truly philoſophical and concluſive is this argument againſt the ſpecies, drawn from the ſcarcity! and yet this, curious as it is, is exceeded by another. We are told, p. 38. that Mr. B. found a quadrifid plant on the top of a bank, on the ſlope of which ſeveral of the ſtellatum of Linn. or Ray's plant grew; *therefore there was no doubt but they muſt have originated from the ſame ſeed.* If this argument be allowed, one may undertake to prove, that the Onopordum Acanthium, and Carduus marianus, certainly proceeded from the ſame ſeed, becauſe they have frequently been found on the ſame bank.

' plants have been reputed to grow, may not meet with one in a whole ſeaſon?' —He has not then met with it very frequently near Norwich; but though certainly a rare ſpecies, it happens to be by no means very ſcarce in this neighbourhood; there being ſeveral ſpots in which it is every year to be found, and ſome of theſe four or five miles aſunder. For ſome years paſt that I have attended to theſe plants, I have never failed meeting with this in ſuch of theſe places as have been viſited; and in this reſpect it is much more certainly to be found than the ſtellatum Linn. which, though much more common, is rarely met with two years on exactly the ſame ſpot; and for this a reaſon will be preſently given. In one place not leſs than ten of the fornicatum Hudſon or quadrifidum Br. have been found within a few yards of each other; and of all, which in the courſe of ſeveral years I have obſerved in different places, not one varied in the arched form or number of its rays*. But if there were a plant accidentally diſcovered with five or three rays, it would no more diſprove the character of the ſpecies, than finding the Paris quadrifolia with five or three leaves, which is not very uncommon, would diſprove the identity of that plant. A ſpecimen, it is true, has been ſhewn to me with three rays; but on examination, it was found that one ray, both of the upper and lower volva, was as broad as the remaining two; and they had begun to ſplit at the points, which were ſeparated for a ſmall ſpace in each. This plant was therefore accidentally prevented from taking its proper form, and yet the arched appearance was preſerved, though not

* Some of theſe plants ſtood on the flat ſurface of the ſummit of a bank, others on ſlopes of very different angles; ſome amongſt buſhes, others on graſſy banks entirely expoſed; all which different ſituations Mr. B. ſays *muſt* occaſion different appearances, and different expanſions of the rays (pp. 37, 38, 39); and yet every one of theſe plants when fully grown correſponded with Blackſtone's fig. except in ſize.

perfectly

perfectly regular, and the upper rays ſtood upon the tips of the lower. In this caſe therefore, evidently, *exceptio probat regulum.*

11. The Lycoperdon ſtellatum Linn. and Hudſ. with its ſuppoſed varieties, and the L. coliforme of Dickſon faſc. 1. remain a conſiderable time in their egg * ſtate; during which the top is nearly level with, or but little elevated above, the ſurface of the ground; and they have a root by which they are fixed, and by means of which they derive the nouriſhment neceſſary to their growth. When fully ripe, the volva burſts at the ſummit into an indeterminate number of rays; the plant is turned inſide out, what was before the upper and outer ſurface becoming the under and inner; it is raiſed entirely out of the ground, and reſts on the expanded rays of the volva; the root, no longer of any uſe, being by this expanſion broken off, and left in the ground. Thus far my obſervations agree with thoſe of Mr. Bryant; but it is by no means a fact, as that author aſſerts (p. 17), *that they have then a tendency to raiſe themſelves on the tips of their rays; or any prehenſile quality, by which they endeavour to lay hold of the graſs, moſs, or whatever is in their way* †. The plant being by the proceſs juſt deſcribed abſolutely liberated from the ground, unleſs accidentally detained, it depends entirely on the ſtate of the atmoſphere whether it remains flat or is contracted. If the air be moiſt, it will probably remain for ſome time

* This term is uſed to expreſs the unopened volva, which ſomewhat reſembles an egg. A plant of coliforme remained in this ſtate apparently unchanged in ſize or figure near four months. This ſpecimen, the fineſt and largeſt hitherto diſcovered of that curious ſpecies, is in the muſeum of Sir J. Banks, P. R. S.

† Though Mr. B. is ſpeaking here of his own ſtellatum, which is a different plant from that of Hudſon, it makes no eſſential difference as to theſe obſervations. Whether his plant remains flat or not, depends equally on the ſtate of the atmoſphere; but his plant changes its appearances repeatedly with the changes of the air from moiſt to dry, and Hudſon's when once contracted preſerves its form and is never again fully dilated.

flat; but if that be dry, the rays will be ſpeedily diveſted of their ſpongy coat, which will ſoon crack and peel off, and then they will ſoon contract; and, if nothing impede their natural tendency, will be incurved, and conſequently raiſed ſomewhat upon their tips. It is evident that if graſs, moſs, or even looſe mould, ſhould be under the plant at this time, ſome may be caught up and retained by them. In dry weather the thick ſpongy coat ſoon cracks, and puts on that teſſelated appearance which is repreſented by Mich. t. 100. f. 6. and in Mr. Bryant's plate f. 4. in which ſtate it has been conſidered by ſome authors as a diſtinct ſpecies: but this appearance is of ſhort duration, being only the prelude to that coat's peeling off; after which the plant becoming very light, is frequently removed by the wind far from its native place; which accounts for this ſpecies being rarely found two years together on the ſame ſpot.

12. Such is the mode of vegetation common to Lycoperdon ſtellatum and coliforme; but the fornicatum of Hudſon is of a very different nature. This plant ariſes from a round or egg-ſhaped volva, which is of a thicker ſubſtance than that of ſtellatum, and like that is fixed in the ground; but which it does not, like that, quit upon opening. The fornicatum when ripe ſplits at the ſummit into four equal, or nearly equal parts; the head, with a correſponding number of rays, is by the opening of the volva raiſed from within its cavity; and the rays in a ſhort time acquiring firmneſs*, are fixed in their arched ſituation, each reſting on its correſponding

* The ſpongy coat is not nearly ſo thick in this ſpecies, on the rays of the plant, as on the ſtellatum of Hudſon, though thicker than on the ſtellatum of Bryant; and its peduncle is obſervable when the volva firſt burſts. And here it is neceſſary again to caution the reader to remember, that the fornicatum as deſcribed by Mr. B. is conſidered as a different plant from that of Hudſon, which I am here deſcribing; and that if it be proved that the latter is not a variety of the former, as he aſſerts, his deſcription of the one plant has nothing to do with the other, and all his arguments deduced from ſuch deſcription muſt fall to the ground.

ſegment

ſegment in the lower volva. In this proceſs there is no actual turning inſide out, as happens to the other ſpecies; and the lower volva being undiſturbed, the plant remains attached to its ſituation, unleſs ſome much greater degree of force be applied to it than is ſufficient to remove the ſtellatum. They are therefore but rarely found looſe, or blown about by the wind; and from this, their being found for years together on the ſame, or nearly the ſame, ſituation is to be accounted for. Their heads are alſo of a much firmer texture, and do not diſcharge the duſt or ſeed with ſo much freedom as the ſtellatum; and to theſe circumſtances their greater degree of ſcarcity may reaſonably be attributed. The root of this plant is rarely found adhering; for though the volva does not reverſe itſelf, as in the ſtellatum, it is evident that the ſplitting and opening of the rays may break off the root; or if not, the plant ſoon after opening, arrives at its full growth and perfection, and the root conſequently decays, and is left in the ground when the plant is taken up. That ſuch is the mode of vegetation, I can aſſert, from having found a plant very recently opened, in which the head had ariſen from the lower volva, and the rays were acquiring their arched ſituation on the tips of the lower rays. This plant was perfectly white, and much reſembled the figures in Schæffer, t. 183. f. 1, 2; but on viſiting the ſpot again two or three days after, it had acquired the perfect ſhape of the fornicatum, as repreſented in Blackſtone's figure; the ſpongy coat had dried, and was beginning to ſcale; and the whole plant had acquired a deep fuſcous colour. That the figure of this plant did not happen from decay is evident; and that it was not forced into ſuch a ſhape by the accidental falling in of mould, &c. between the coats of the volva, is certain, becauſe it grew on a flat ſurface under the ſhelter of a buſh; and neither graſs, moſs, nor any other ſubſtance was found in the cavity

of

of the volva, or inſerted between the arched rays ſupporting the head.

13. That the volva of this plant lies deep in the ground is very true; that is to ſay, the top of the unopened volva is uſually even with the ſurface, or perhaps ſunk juſt beneath it; and this very circumſtance, which Mr. Bryant adduces as a proof of its being a variety, is, from its concomitant circumſtances, a moſt convincing one of its being a real ſpecies. The opened volva, if the plant has been undiſturbed, and is not actually looſened and rolling about, which is ſeldom the caſe, is always buried nearly or quite to its tips in the ground. From attending to this, it will appear evidently impoſſible that it ſhould open in the ſame manner as the ſtellatum; which by its ſplitting at the top, and the rays abſolutely reverſing their ſituation, is raiſed entirely out of the ground. But Mr. Bryant ſays (p. 38) that, after having raiſed themſelves out of the ground, and actually ſtanding on the tips of the rays, the lower ſkin ſeparates, and forms the bag; '*owing to the ſun and dry winds getting* '*in and cauſing the two ſkins to ſlake from each other; the conſequence of* '*which is, as the upper cuticle contracts, it muſt recede from the under,* '*and ſtand upon its tips.*' It is evident, from this mode of accounting for it, that, as the lower volva is always buried in the ground, the under coat muſt recede from the upper, and, by ſome unknown power, again plunge itſelf into the earth, which it had ſome time before ſprung out of; for as it is uſually empty, and clear of any mould or other matter, it is impoſſible that any run of a bank ſhould occaſion this immerſion: beſides, it is often found, as has been before obſerved, on a flat ſurface, or on banks covered with graſs or moſs, in either of which ſituations it is utterly impoſſible that any run of the mould could take place.

14. Again: it is evident, that if two plants of the ſtellatum ſtand

nearer each other than the amount of the ſemi-diameters of the circles formed by the expanſion of their reſpective rays, and theſe plants open nearly together, the rays of the laſt which expands muſt lie imbricated over the rays of the firſt. Or, if they ſhould open at the ſame inſtant, the rays muſt be prevented from their full expanſion, and remain ſupported by each other; in which caſe the heads muſt be below, or on a level with the tips of the rays on that ſide, whilſt on the other the plants would be fully expanded*. The ſame appearance muſt happen to a ſingle plant, if in conſequence of meeting with any obſtruction it is permitted only to open partially; of which inſtances are given by Mr. Bryant (p. 30—32), and repreſented in his plate, fig. 16, 17. A ſtill ſtronger inſtance is given in the ſame place, of a plant, which from growing in a hole was prevented from expanding at all, and remained conſequently with the rays ſurrounding the head. Fig. 2. of his plate, though not given with that deſign, well repreſents this; and, with the others juſt quoted, will fully explain and exemplify what is here aſſerted.

15. It ſeems not very uncommon for the Lycoperdon fornicatum to grow in pairs, forming a kind of twin plant†. I have ſeveral times met with ſuch, and in one particular ſpot have for three ſucceſſive years found ſpecimens anſwering that deſcription. One of theſe, which was gathered in the laſt autumn (1790), I have now the honour of laying before the Society. Theſe plants grew on the ſlope of the north ſide of a ſteep bank, abſolutely free from any buſhes or briers, and covered entirely with graſs and moſs, which prevented the ſoil from running. The inequality of the ground

* Vide Schæff. t. 182. f. 2. where this is well exemplified.

† Batarra, *app.* p. 74. mentions receiving a twin plant of this Lycoperdon from a correſpondent.

on

on which theſe ſtood, ſhould, according to Mr. Bryant (p. 39), have occaſioned an irregularity in the plants. The lower volvæ, though not abſolutely coaleſced, are ſo united, that they cannot be ſeparated without ſome force and damage; it is evident therefore that they grew cloſe together before opening; and from the ſoil which ſtill adheres, it is farther evident, that they were fixed in the ground to the tips of the lower volvæ. Therefore, had theſe plants opened in the manner in which the ſtellatum is known and acknowledged to expand, they would have been in the ſituation which is deſcribed in the foregoing ſection; and the heads muſt have been mutually covered or ſhaded on the ſides where they touch, by the unexpanded rays, as repreſented in the figures 16. and 17. there referred to: or rather, as the earth in which they were ſunk muſt have prevented their expanſion on the ſides oppoſite to thoſe on which they touch, they would have been repreſented by fig. 2, ſuppoſing another exactly ſimilar figure joined to it. But as the arch of each is fully and regularly formed, and the volvæ regularly divided; and as from the ſituation on which they grew, none of the accidental cauſes ſuppoſed by Mr. B. could operate upon theſe plants; it is evident that the heads, and quadrifid arched rays, on which they are ſupported, muſt have ariſen from the volvæ, and fixed themſelves in their preſent form. A careful inſpection of the ſpecimens, and compariſon of them with the figures, and with what is here aſſerted, will, I truſt, convince any unprejudiced obſerver, that ſuch muſt be the mode of growth of this very extraordinary plant.

16. The lower volva (or caſe as it really is) is of a thick and rigid ſubſtance, extremely different from the thin outer coat of the ſtellatum of Linn. and Hudſ. as a bare inſpection will evince; and the bottom of this, in the fully-expanded and perfect plant, is gene-

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rally flattened; the rays are uſually ſplit ſo far, and are broad and ſhort; whilſt thoſe which ſupport the head are much longer and narrower, equally ſplit to within about half an inch of the head, and always convex outwardly, and concave inwardly, which occaſions them to form rounded angles. The interior ſurfaces of both upper and lower volva are ſmooth, and ſhew no traces of having been forced aſunder: on the contrary, a bare inſpection muſt convince any one, that though they undoubtedly muſt have been in contact, they ſhew no appearance of having been united, except at the tips, where they ſo ſtrongly adhere, that ſome conſiderable force would be neceſſary to ſeparate them*. At this time the actual meaſurements, of what Mr. Bryant ſuppoſes correſponding parts, by no means accord; and it would be beyond the art of man, by moiſtening or any other proceſs, to bring the upper and lower rays to be commenſurate with each other. From what cauſe it is, that this growth or extenſion, and this arched form of the upper rays take place, we know not; but the fact is the ſame in all ſituations. It has been ſufficiently proved, that this cannot be occaſioned by the cauſes to which Mr. Bryant attributes it; and ſo far from having the appearance of being accidental, the whole looks much more like a work of art than of nature, and is uſually taken for ſuch by perſons unaccuſtomed to botanical ſubjects. This ſurpriſingly ſingular conformation has been looked upon to be the reſult of accident and blind chance!

* If the ſingular appearance of this plant be owing to the accidental ſeparation of the coats of the volva, from decay, and the other cauſes to which it is attributed in the pamphlet, how happens it that they ſo regularly ſeparate to the tips of the rays only? and why do not the ſame cauſes operate to ſeparate them entirely? It would extremely puzzle the author of the pamphlet to anſwer this queſtion ſatisfactorily; and the whole might be reſted on this ſole argument, were it neceſſary.

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GARDEN.

17. A ſuſpicion has been before hinted, that Mr. Bryant has been led into theſe miſtakes by finding a ſtellated Lycoperdon with a ſeſſile head, which he with reaſon thought muſt be a different ſpecies from thoſe which had pedunculated heads; notwithſtanding Linnæus has quoted as ſynonyms to his ſtellatum, authors who have deſcribed plants both ſeſſile and pedunculated, without even allowing this peculiar circumſtance to form a variety. This appeared the more likely, as it can hardly be ſuppoſed, that ſo patient and accurate an obſerver could have deſcribed as having ſeſſile heads, plants which are never found without the peduncle; deceived by the thickneſs of the interior (apparently exterior) ſpongy coat of the rays, which it has been before obſerved completely hides the footſtalk of the ſtellatum of Linn. and Hudſon, when freſhly opened, and even for ſome days, if the plant be ſoon after expanding removed into the houſe*. It is therefore not unreaſonable to conclude, that the plant called Lyc. ſtellatum by Mr. Bryant is actually the ſpecies mentioned f. 8, and which will preſently be more fully deſcribed; as this is the only ſtellated Lycoperdon with a ſeſſile head which has been met with by other botaniſts in this country, and as the deſcription and figures of Mr. Bryant's ſtellatum perfectly accord with this plant. That this is a perfectly diſtinct ſpecies from the plant of Ray's ſyn. and conſequently from the L. ſtellatum of Linn. and Hudſ. will not admit of a doubt; and the ſmall variety, which is excellently figured in Mr. Bryant's plate f. 10. is the plant, the rays of which are ſo peculiarly ſenſible to the effects of moiſture or dryneſs in the atmoſphere. This circumſtance has occaſioned that author to give thoſe

* I have repeatedly brought home recently opened ſpecimens, the heads of which have appeared perfectly ſeſſile, and which have retained that appearance for two or three days; till, by the drying of the ſpongy coat, the peduncle has appeared.

fanci-

fanciful deſcriptions of the animal nature of theſe plants (p. 41 et ſeq.); an idea which is of itſelf ſufficient to convince the cool naturaliſt of the readineſs with which this otherwiſe ingenious botaniſt is apt to catch at any thing which intereſts his imagination. To the variations of the atmoſphere are alſo to be attributed the contraction and dilatation of the teeth or ciliæ ſurrounding the mouth in the different ſpecies, which remain as long as any duſt is contained in the head; though this circumſtance Mr. Bryant alſo attributes to the animal nature of the plant, and ſuppoſes to be voluntary as long as the plant has life. But unfortunately for his arguments, which prove rather too much, the prehenſile property of the claws (for ſo are the rays called) is ſuppoſed to continue even after death; as one of theſe plants has held an unfortunate fornicatum of Hudſ. '*in its mercileſs gripe*' for ſeveral years in a drawer of the author's cabinet (p. 45). There can be no neceſſity for entering into any arguments to prove, that theſe appearances are entirely owing to the coriaceous nature of theſe plants, and that they are acted upon by a moiſt or dry air, exactly in the ſame manner as any other ſubſtances of the ſame kind. It was nevertheleſs neceſſary to take notice of it, as the author builds part of his ſyſtem upon it, not only having an idea, that in the plants juſt mentioned it is ſpontaneous; but alſo (p. 17, 18) attributing a ſurpriſing degree of natural elaſticity to the rays of his ſtellatum, from the circumſtance of one of them diſengaging itſelf with great force from a couple of pens, with which he had endeavoured to expand the incurved rays, to take a drawing of it *. It evidently appears that this proceeded entirely from the ſame cauſe, and not from any ſpontaneous elaſticity naturally inherent in the plant, which had

* The circumſtance here mentioned affords an additional proof, that this ſtellatum of Bryant is really the plant mentioned in the beginning of this ſection, and ſ. 8.

been removed from its natural ſituation on (probably) a moiſt bank, and directly brought into a dry room and placed upon a table.

18. This eſſay has been drawn out to a much greater length than was at firſt thought of, and for this ſome apology may be neceſſary: but it muſt be conſidered, that a principal object of it is to eſtabliſh the Lycoperdon fornicatum of Hudſon as a ſpecies; and that it was impoſſible to do this effectually, without anſwering the objections made by the author of 'the Hiſtorical Account of two Lycoperdons.' It muſt be farther underſtood, that theſe objections are ſcattered through 52 octavo pages, and that the correſponding obſervations and arguments are frequently to be ſought for at many pages diſtance; and it may then ceaſe to be ſurpriſing that it could not be compriſed in a ſhorter compaſs, and that ſome ſlight repetitions may have unavoidably crept in. But though already much too long, indulgence muſt be requeſted for a word or two more upon Mr. Bryant's plate, which is abſolutely neceſſary before it is concluded. The figures in this plate from 1 to 10 incluſive, are all referred to L. ſtellatum, and from 11 to 20 to fornicatum; but it is to be obſerved, that the fornicatum of Bryant* is the ſtellatum of Ray's ſyn. 27. t. 1. f. 1. and that all theſe figures, except 15 and 20, are profeſſedly different appearances of Ray's plant. How much all theſe differ from the figures in Phil. Tranſ. and Blackſ. Sp. bot. and alſo from Sch. 183. will be eaſily ſeen by comparing them together. All Mr. Bryant's figures, except 15 and 20, ſplit into an uncertain number of rays; and theſe vary in their ſeparations, as to the diſtance from the head, and form extremely acute angles with each other. The figures 15 and 20 are declared to be intended as repreſentations of the fornicatum quadrifidum, or fornicatum of Hudſon; and though I would not willingly acuſe Mr. Bryant of having miſrepreſented the ſpecimens to ſupport his own

* Vide antea. Notes to ſ. 7 and 12.

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ſyſtem, I am under the neceſſity of ſaying, that they do by no means repreſent the plant fairly. Let a compariſon of theſe figures with ſpecimens be made; and at the ſame time a compariſon of the figures and ſpecimens with the figures in Phil. Tranſ. and Blackſt. Sp. bot. and the truth of my aſſertion will evidently appear. Mr. Bryant's fig. 15, which is intended to repreſent a perfect quadrifidum, exhibits the lower rays, or diviſions of the volva, equal in length and breadth to the upper, and ſplit abſolutely to the centre. The upper rays are figured flat, forming acute angles at their junction, and touching the lower only at ſome ſmall diſtance from their tips; they are alſo curved in a direction never ſeen in this plant, except recently opened, as figured in Sch. 183. 1. but this is profeſſedly an old ſpecimen in a ſtate of decay, and rolling about, the ſport of wind and weather (p. 28). From theſe circumſtances, I ſhould have been led to ſuppoſe that Mr. Bryant had actually never ſeen and examined the real Lycoperdon fornicatum, had I not been ſhewn a ſpecimen received from him, which correſponded exactly with mine, and the figures I have quoted. The only concluſion I can therefore draw (for I am very far from accuſing, or even thinking Mr. Bryant capable of wilful miſrepreſentation) is, that he may have met with a ſpecimen or ſpecimens of Ray's plant, in which ſome of the accidents deſcribed may have taken place, and cauſed ſome variation in the appearance of the plant, and ſome reſemblance of the double volva. The ſpecimen from which fig. 14 was taken, which ſeems to have been partially buried in the ground, may have been of this ſort; and with the help of a warm imagination, of which ſtrong inſtances have been given, and a violent paſſion for forming a theory, would afford ſufficient ground for this author to work upon. This is the more probable, as he has deſcribed the Lyc. fornicatum, B. quadrifidum, or fornicatum of Hudſon's Fl. Ang. to be a plant of extraordinary rarity. But

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ſuch a circumſtance, if it really did happen, would prove nothing againſt the arguments brought in favour of the ſpecific character of that plant.

ENUMERATION.

IT now remains to enumerate the different ſpecies of ſtellated Lycoperdons which have been found in this neighbourhood; and theſe are preſumed to be four. Of theſe, the ſtellatum of Linn. and Hudſ. and the fornicatum of Hudſon have been ſo amply treated of in the foregoing pages, that little more remains neceſſary, than to apply to them ſuch ſynonyms as really appear to belong to the reſpective ſpecies. This will be an eaſy taſk in reſpect of the fornicatum, which has been mentioned but by very few authors; but great difficulty ariſes in adjuſting ſuch as belong to ſtellatum. Many authors have deſcribed a plant of this ſort with a ſeſſile head; and their deſcriptions are in general ſo vague, and their ſynonyms ſo confuſed, that it is impoſſible to aſcertain with certainty, whether they mean the ſtellatum of Linnæus and Hudſon; the Lycoperdon which I ſhall call after Schmiedel by the trivial name of *recolligens;* or ſome other plant which may be different from both. For theſe reaſons I ſhall be very ſparing of applying ſynonyms to both theſe ſpecies. The Lycoperdon coliforme of Dickſon's 1ſt faſc. makes up the number ſpecified.

Lycoperdon ſtellatum—Volvâ multifidâ patente; *laciniis inæqualibus*, capitulo *pedunculato* glabro; ore acuminato dentato. *Linn. Sp. pl.* 1653. *Hud. Fl. Ang.* 643.

Diag.

Diagn. The volva is irregularly ſplit into an uncertain number of rays; the head nearly globular, and ſupported on a peduncle; the mouth ſurrounded with ciliæ, converging into a cone; and the whole plant of a dirty white generally, but the head ſometimes tinged ſlightly with grey.

As Linnæus has quoted Ray, there can be no doubt but his ſtellatum is the ſame as Hudſon's; but ſome of the ſyn. quoted in Sp. pl. and his other works are doubtful, the head in them being deſcribed ſeſſile.

Fungus pulverulentus crepitus lupi dictus, coronatus et inferne ſtellatus. *R. Syn.* 27. *t.* 1. *f.* 1.—This is the beſt repreſentation of this plant I have hitherto ſeen.

Lycoperdon fornicatum. *Bryant's Hiſt. Acc. of two Lycoperdons*, *f.* 12. 13. 14. 16. 17. are undoubtedly to be referred here from his own authority.

Lycoperdon fornicatum. *Relhan Fl. Cantab.* 981. rejecting the ſyn. of Hudſon, Schæffer, and Batarra.

Schmiedel Ic. pl. 46. certainly belongs to ſtellatum. *Pl.* 43. exactly reſembles *Schæff. fig. t.* 182, and is therefore doubtful.

Pollich. palat. 1197. exactly copies Linnæus. The above are all the authors, which have fallen under my obſervation, that I can ſafely quote to this ſpecies.

Schæffer t. 182. Theſe figures extremely reſemble our plant recently opened, and before the peduncle becomes viſible, but the head is deſcribed as ſeſſile; and yet the author refers to Raii ſyn. and the fig. of Dillenius, which makes it probable that he had not well conſidered, and had not very clear ideas of theſe plants. It may poſſibly be ſome ſpecies which has not yet fallen under my obſervation.

Hall. Helv. 2174. Lyc. cortice exteriori revoluto ſtellato. No notice is taken by this author, whether the head be pedunculated

or

or ſeſſile; and the ſyn. are ſo contradictory, that nothing can be made out from them. He quotes *Eph. nat. cur. ann.* 4. *obſ.* 90. which is Lyc. fornicatum Hudſ. for this ſpecies. *Mich. t.* 100. *f.* 6. with the teſſelated rays is alſo mentioned as a variety, and alſo the plant with the rays again divided, *f.* 5.

Scop. carn. 1633 and 1634, enumerates two ſpecies, of which the firſt from the ſpecific character ſhould be recolligens; but the diagn. contradicts this, and his ſyn. will not help the difficulty. He quotes *Hamb. Mag. tom.* 5. *p.* 411. *f.* 1. for this ſpecies, and *p.* 403. *f.* 5. for coronatum; but theſe figures, which are very bad, repreſent the ſame plant. The references for coronatum are quite contradictory; as it is impoſſible that *Sch.* 182. 1. *Bat.* 39. 1. and *Mich.* 100. 3. can all repreſent the ſame plant, and *Sch.* 182. 1. and 182. 2. differ but in ſize from each other. The coronatum is deſcribed as growing on decayed trees, for ſo I muſt underſtand '*in truncis*' to mean, and none of our ſtellated Lycoperdons are ever found in this ſituation.

Mich. nov. gen. 220. *t.* 100. *f.* 1—6. Geaſter. This author has deſcribed and figured ſix ſpecies. One of theſe, No. 3. f. 2. is deſcribed as having a ſhort peduncle; but neither deſcriptions nor figures point out whether the heads of the reſt are ſeſſile or pedunculated. No. 1. f. 1. is doubtfully referred to R. ſyn. but from the number and regularity of the rays, the form of the head and mouth, and the apparent tendency of the rays, as repreſented in the plate, to turn upwards, it more reſembles recolligens. No. 4. f. 4. exactly reſembles f. 1. except that it has ſix rays only; and the mouth is quite naked; a circumſtance which prevents its being ſafely referred to any Britiſh ſpecies. No. 3. f. 2. ſomewhat reſembles the ſmall variety of ſtellatum; but the head is ſcarcely flat enough, and the peduncle is not ſimilar. No. 2. f. 3. ſeems to be really recolligens. No. 5. f. 5. reſembles ſtellatum with the rays

ſplit, but the mouth of this is alſo naked; as is f. 6. which from the number of rays and ſhape of the head might be otherwiſe recolligens. None of theſe can therefore be ſafely quoted for ſtellatum.

Bocc. Muſ. t. 305. *f.* 4 is very doubtful.

Buxb. Cent. 2. *t.* 49. *f.* 3. is ſo bad a figure that it cannot be quoted with any certainty; it approaches neareſt to ſtellatum of *Sch. t.* 182.

Dalib. Paris. 390. is impoſſible to aſcertain, as he has neither deſcription nor figure.

Royen. Lugd. Bat. 519. quotes *R. ſyn. t.* 1. *f.* 1. and *Mich. t.* 100. *f.* 1, 2, 3. It is therefore uncertain whether his plant be ſtellatum Linn. and Hudſ. or not.

Tourn. Inſt. R. H. 563. *t.* 331. is referred to *Bocc. Muſ.* The figure is ſo bad, that it cannot be at all determined.

Vaill. Paris. 123. Lyc. veſicarium ſtellatum is referred to Tournefort without any deſcription.

Fl. Dan. 360. may be ſome new ſpecies; it certainly does not at all reſemble our ſtellatum.

Gleditſch. p. 151. has ſeveral varieties: but his ſpecies is probably to be referred to ſtellatum; though, as he gives no figures, it is doubtful.

Obſ. When freſh opened the head is uſually more or leſs depreſſed, and often ſomewhat oval; but when the thick coat is either peeled off, or dried upon the rays, the head uſually becomes globular, and reſembles the figure in R. ſyn. and the plant then appears ſo different, that a perſon unaccuſtomed to obſerve them would ſcarcely believe it could be the ſame. The peduncle is generally thickened at the top and the bottom, and ſmalleſt in the middle, or, as it may be called, doubly club-ſhaped; but ſometimes it is cylindrical. From theſe different appearances, this plant has been differently

deſcribed by various authors; but probably the ſame, or ſome ſlight variety, has been intended by the greater part of them.

ANGL. *Star puff-ball*—In various places near Bungay in the ſpring and autumn, and the winter if it be mild.

β minor—The only permanent variety I have met with here, and which certainly is not diſtinct, may be characteriſed—*capitulo ſuperne plano, ore acuminato, ciliis longioribus.* See *Bryant's Hiſt. Acc. f.* 19. the head only, but admirably well expreſſed.

This elegant little variety grows on dry banks, uſually amongſt ivy, and ſeldom exceeds an inch or an inch and half in the diameter of its expanded rays. The colour is dark brown; the head flat on the top; and the mouth ſurrounded with long ciliæ, forming a very ſharp cone; the peduncle is longer in proportion to the ſize of the plant than in α.

Mich. t. 100. *f.* 2. may poſſibly be this plant. It is found in Ditchingham, Earſham, and other places near Bungay.

Lycoperdon recolligens—Volva multifida patente, *laciniis æqualibus*; capitulo depreſſo-ſphærico, *ſeſſili*; ore acuminato.

Diagn. Rays of the volva equal, 5 to 7, rarely more; when dry, reflected over the head; head ſeſſile.

Lycoperdon volvans recolligens. *Schmiedel Icones plant.* 27, 28. *f.* 20 to 31. rejecting the ſyn. which are doubtful. The deſcription is extremely good, but the plant is figured and deſcribed with rays from 5 to 20, equal or unequal, entire and ſplit, which circumſtances do not entirely accord with the Engliſh ſpecimens; and poſſibly the author may have confounded two ſpecies together. He ſays of the head, '*Capitulum ſeu globulus volvæ medio firmiter innaſcitur, ſeſſilis, abſque pedunculo aliquali:*' which perfectly agrees with our plant.

Lycoperdon ſtellatum.—*Bulliard, Plantes de la France, t.* 238.

Lycoperdon ſtellatum—*Bryant's Hiſt. Acc. of two Lycoperdons—f.* 3, 4, 5, 6. 10. The ſpecific character of Mr. Bryant's Lyc. ſtell. '*capitulo albido ſeſſili*' ſo entirely agrees with this ſpecies, and his fig. 10. is ſo excellent a repreſentation of the ſmall ſpecimens, and the others here quoted very good ones of the large ones, with which the account, p. 43, 44, alſo well accords, that I can have no doubt in referring his plant here.

Lycoperdon ſtellatum—*Relhan Fl. Cantab.* 980. admitting only the ſyn. of Bryant and Micheli.

Mich. t. 100. *f.* 3. and perhaps 1. 4. 6.

Obſ. The volva is uſually divided into 5, 6, or 7 rays, which are equal, or nearly ſo, of a cheſnut colour on the upper ſide when expanded, and ſilvery white beneath. The head ſpherical, conſiderably depreſſed, perfectly ſeſſile, of a yellowiſh white or pale ſtraw-colour; the mouth ciliated, and uſually ſurrounded with a circle of a paler colour; and a ſimilar circle is often obſerved on the upper part of the rays ſurrounding the head. The rays when moiſt are regularly inflected, as repreſented in the figures of Bryant and Bulliard; but when dry are reflected, and entirely cover the head. If they are kept in a dry place, they will at any time undergo theſe changes, by placing them in a ſaucer with a ſmall quantity of water, and again drying them; but the changes are quicker, and more certain in the ſmall plants, than in the large ones. The diameter of the expanded rays varies from one inch to three or four, and the ſize of the head from that of a pea to an inch diameter.

ANGL. *Hygrometric puff-ball*—Ditchingham and Earlham, Norfolk; Mettingham, Suffolk, near Bungay. Spring and autumn.

Lycoperdon coliforme—Volva multifida patente, capitulo depreſſo-ſphærico, *pedunculis oſculiſque numeroſis. Dickſon, Faſc. plant. crypt.* 1. 24. *t.* 3. *f.* 4.—*With. Bot. arr. ed.* 1. 783*.

* *Ed.* 2. *vol.* 3. 460.

Fungus pulverulentus coli inſtar perforatus. *R. ſyn.* 27. rejecting the ſyn. of Tournefort.

Diagn. The volva multifid, rays irregular, mouths and peduncles numerous.

Obſ. The head is in the large ſpecimens conſiderably depreſſed; in the ſmall ones nearly ſpherical; of a whitiſh colour, and covered with a thin tunicle of a moſt beautiful ſilvery grey, peculiar to this ſpecies, but ſimilar to that which forms the outer coat of the recolligens. The mouths are numerous, ſlightly elevated, and fringed with fine hairs. The peduncles, which do not appear till the thick ſpongy coat dries or peels off, are numerous, woody, filiform or ſtrap-ſhaped; and appear to bear ſome kind of proportion to the number of the mouths, though there are no correſponding cells. In the ſmall ſpecimens the mouths and peduncles are few. It has been doubted whether theſe mouths might not be accidental, and formed by inſects after the expanſion of the plant. But this (not to mention their regularity, and that each is ſurrounded by its border of ciliæ) is clearly diſproved, from the marks of the projections formed by the mouths being ſeen on the expanded rays, when freſhly opened, as repreſented in Dickſon, *t.* 3. *f.* 4. *ad litt. b.* I have likewiſe found an abortive plant, in which the ſeed did not ripen; but which had numerous projecting papillæ on the head, where the mouths ſhould have been formed.

The volva of this Lycoperdon is ſunk deep into the ground, the ſummit being on a level with, or very little elevated above, the ſurface. On taking one up, it was found to be nearly globular, but ſlightly depreſſed; of a dirty white, wrinkled and ſcaly; with a ſhort thick root terminated by a few ſmall fibres. When cut open, this conſiſted of a ſoft coriaceous coat, within which was another thicker, and of a much tougher ſubſtance, filled with a white curd-like ſubſtance, of a very diſagreeable ſmell. This was ſo young

that

that there was no appearance of the head. They remain a conſiderable time in this ſtate, appearing to ripen ſlowly: one which was diſcovered about the middle of Auguſt, remained unchanged to the end of November, when it was found fully expanded, and reſting on the ſurface of the ground, in which it had been before buried. This had been viſited the preceding day, and not any alteration had been then obſerved in it. It appears therefore, that when ripe, the change is very ſudden; and that the head, preſſing againſt the interior part of the volva, and probably aſſiſted by the action of the ſun (for the day on which it expanded was remarkably bright and fine), the outer coat ſuddenly gives way, is ſplit into an indeterminate number of rays; the root is broken off, and left in the ground; and the plant being turned inſide out, is neceſſarily raiſed upon the ſurface, what was before the outer and upper part of the volva being now next to the ground. This, which has been before (ſ. 11.) deſcribed as the mode of expanſion of the ſtellatum, is alſo common to theſe with the recolligens.

Angl. *Cullender puff-ball.*—Gillingham and Earſham, Norfolk; Bungay, and Mettingham, Suffolk. In the autumn. I have never met with a freſhly opened ſpecimen of this ſpecies at any other ſeaſon.

Lycoperdon fornicatum—Volva *quadrifida fornicata*; capitulo *pedunculato*, glabro; ore obtuſo ciliato.
Hudſ. Fl. Ang. 644.

Diagn. The volva quadrifid, and remaining in the ground when opened. The head globular, pedunculated, and elevated upon four arched rays, reſting on the tips of the diviſions of the volva; the mouth open, and ſurrounded with ciliæ, forming a cylinder; the freſh plant white; but the whole ſoon changing to a dark brown.

Geaſter volvæ radiis et operculo elevatis. *Watſon Phil. Tranſ. vol.* 43. *p.* 234. *t.* 2. *f.* 11 and 12.

Fungus

Fungus pulverulentus turriculam fornicatam referens. *Blackſt. Sp. Bot. p.* 24. *t.* 2. a very good figure, but larger than the plant is uſually found.

Fungi monſtroſæ ac inſolitæ formæ. *Royger. Eph. nat. cur. dec.* 1. *ann.* 4. *obſ.* 90.

Lycoperdon coronatum *Sch. t.* 183. exceedingly good figures of the plant recently opened, and before it changes its colour. The deſcription is tolerably accurate; but the ſyn. are all to be rejected except Batarra.

Geaſteroides. *Batarra fung. app.* 74. *t.* 39. *f.* 1 and 4. excepting the root; *f.* 3. ſeems imaginary. A twin plant is mentioned by this author.

Lycoperdon fornicatum B. quadrifidum. *Bryant's Hiſt. Acc. f.* 15.

L. feneſtrati var. β and ν *Batſch. El. Fungor.* 243. *t.* 29. *f.* 168. a. b.

ANGL. *Turret puff-ball.*—Earſham, Ditchingham, Brome, and Gillingham, Norfolk; Bungay, Suffolk.—In the autumn.

POSTSCRIPT. It was at firſt intended to add, by way of appendix, ſome obſervations upon the Lycoperdon Carpobolus; which, if really a Lycoperdon, more properly belongs to this, than any other diviſion of the genus. The preſent paper has, however, extended to ſo much greater a length than was originally thought of, that the author muſt reſerve what he had to offer upon the Carpobolus for ſome future leiſure, if the preſent communication ſhould be thought worthy of the notice of the Society.

VIII. *A new Arrangement of Papilios, in a Letter to the Preſident. By Mr. William Jones, F. L. S.*

Read July 5, 1791.

DEAR SIR,

MAY I preſume to offer to the conſideration of the gentlemen of the Linnean Society ſome remarks upon Linnæus's diviſion of the genus of Papilio, and to point out obvious diſtinctions by which they may be claſſed with more certainty? From the ſhape of the wings, a principal character with Linnæus, though various, yet in that variety ſo gradually approaching each other, I find it impoſſible to draw the diſtinguiſhing line: I therefore apply to anatomy for ſuch characters as may with certainty diſtinguiſh each family from the others. The ſpecimens that had been inſpected by that great obſerver of nature were few in proportion to thoſe ſince known; it was difficult therefore to aſcertain, with the preciſion neceſſary, thoſe diſtinctions that a further and more extenſive acquaintance with a far greater number afforded; and yet, though his characters were not ſufficiently marked, they have gone far to lay a foundation for a more correct diviſion; and that, ſo far from raiſing new difficulties, I think points out the very ſcheme more clearly which Linnæus himſelf had adopted, and would have further elucidated, had he ſeen more on the ſame ſubject; for it may be preſumed he was acquainted with very few more than he had in his laſt edition of his Syſtema deſcribed, only 274 Papilios; an inconſiderable num-

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ber if brought in compariſon with what I have ſeen, *viz.* above 1000, in the various cabinets in London, and above 400 more in various plates publiſhed by different authors: it is not to be wondered that he had not entered into the minutiæ of thoſe diſtinctions which appear evident upon a farther inſpection to ſeparate the particular families. The great leading outlines therefore only ſtruck him, and theſe have occaſioned the miſtakes that he has run into reſpecting ſome of the Achivi, which when rectified, with a few others in the other diviſions, his arrangement will be clear and deciſive. But without attending to theſe remarks it is liable to error, as may be ſeen by Fabricius, who happening to deſcribe a Papilio from two different cabinets, placed it once with the Equites and once with the Danai Feſtivi, with either of which it might be claſſed by adhering only to Linnæus's indefinite characters.

I am confirmed in my ſentiments hereon by obſerving what both Linnæus and Mr. Yeats ſay of Papilio Apollo, *viz.* that the larvæ of this Papilio have two horns ſituated on its neck like thoſe of many of the Equites, with which family I place it; clearly ſhewing that the families may not only be diſtinguiſhed in the perfect inſect, but have frequently, if not generally, a diſtinguiſhing character in the larvæ alſo, and that theſe diſtinctions are not imaginary, but certain and ſpecific. I have therefore given in the following remarks, Linnæus's characters, adding only what will more certainly fix the limits or marks of each family.

EQUITES. The upper wings are longer from the poſterior angle to the point, than to the baſe: the antennæ often filiform.

Corrected by ſaying

the upper wings are longer from the poſterior angle to the point than to the baſe, occaſioned by having four nerves inſtead of three, viſible in every other family—

the palpi frequently only a brush — under wings with a connecting nerve in the centre, and without an abdominal groove.

These distinctions will evidently preserve this family from all others by having characters peculiar to itself, but will occasion the removal of Teucer, Idomeneus, Menelaus, Achilles, Nestor (with Patroclus, which I have my doubts of being a Papilio), and a few more from the Achivi, to the Danai and Nymphales with which they more properly ought to be arranged. It will also bring to this division from the Heliconii, Apollo and Mnemosyne; and from the Nymphales, Rumina, Panope, Dissimilis, and perhaps one or two more.—— I remark there is not one arranged with the Troes but what is truly an Eques.

Upon looking over Cramer, I observe, he had been under equal difficulties with myself; that he had added to the Equites, Panope, Dissimilis, and some others, as I have done; from the Achivi he had selected many, and formed a new division called Argonauts, which seems composed of such as truly belong to the Nymphales, and have been placed with the Achivi, apparently only for their size and beauty. Describing Xiphares (which Mr. Fabricius has placed with the Achivi), he says "Selon la division de Mr. Linnæus celui-ci, comme le Pap. Jason, Pyrrhus, & plusieurs autres qui les resemblent, appartiendroient aux Chevaliers Grecs: mais le caractere distinctif & susmentionné des pattes, les font ranger, selon moi, dans une autre, ou dans une famille particuliere des Papillons diurnes."

Heliconii. Wings narrow, entire, often naked or deprived of ſcales; the upper wings long, the inferior ſhort—

Add,

with a connecting nerve in the centre; very ſlightly grooved, to admit the abdomen, which is in general long, as are alſo the antennæ.

Danai. Wings entire—

Add,

the under with a connecting nerve in the centre, and a deep abdominal groove; palpi projected.

As I before remarked under the Equites, that the Troes had each of them the character aſſigned to the Equites, it was neceſſary the Achivi ſhould have the ſame. So in the Danai Candidi, as every ſpecimen deſcribed by Linnæus has the ſame character, *viz.* the connecting nerve, it is neceſſary alſo that the Danai Feſtivi ſhould have the ſame.

Nymphales. Wings denticulated—

Add,

the under without a connecting nerve in the centre, and with a deep abdominal groove, palpi projected.

N. B. The terms of ſubintegerrimus to ſome of the Danai, and ſubdentatus to ſome of the Nymphales, approach ſo near as to confound the one family with the other; but the connecting nerve in the centre of the wing is a certain diſtinguiſhing character between the Danai and Nymphales.

Plebeii. Small.

Rurales—Spots on the wings obſcure.

Urbicolæ—Spots on the wings for the moſt part tranſparent.

As

As ſize can be no diſtinction to form a character, each family being of various dimenſions, it is neceſſary to point out a character which others do not partake of, and which may eaſily be done, having even been noticed by Mr. Yeats in his Inſtitutions of Entomology, p. 132, yet altogether not quite ſufficiently—his words are as follows:

"The family of the Plebeii is very inaccurate, and con-
"tains inſects very different from one another, at the
"ſame time that they reſemble, and have all the cha-
"racters of ſome or other of the preceding ones, under
"which many of them, I think, might be properly arrang-
"ed. The remaining Plebeii would compoſe a family very
"diſtinct from all the others, and which might be formed
"into two ſections; the firſt containing ſmall butterflies,
"having long and flexible or weak tails, ſlender bodies, and
"clubbed antennæ, as Cupido, Marſyas, Bœticus, &c.
"the other diſtinguiſhed by the ſhortneſs, thickneſs, or
"breadth of their head, thorax and abdomen, and by
"the ſhape of their upper wings, which in theſe laſt are
"pointed at their extremity, and long in proportion to
"their width, as the Proteus, Phidias, &c.

"The antennæ in this laſt diviſion are generally un-
"cinated or crooked at their extremity; ſome of them
"have likewiſe tails, but theſe are very broad and
"ſtrong, and are always ciliated, or edged with a fringe
"of hairs, as in the Proteus, &c."

They may therefore be thus divided:

PLEBEII *Rurales*—Thorax and abdomen ſlender; under wings without a connecting nerve; antennæ clubbed.
—with long, weak, flexible tails.
—without tails, wings entire.

PLEBEII *Urbicolæ*—Thorax and abdomen ſhort, thick, or broad; under wings without a connecting nerve; antennæ uncinated or crooked at the extremity.

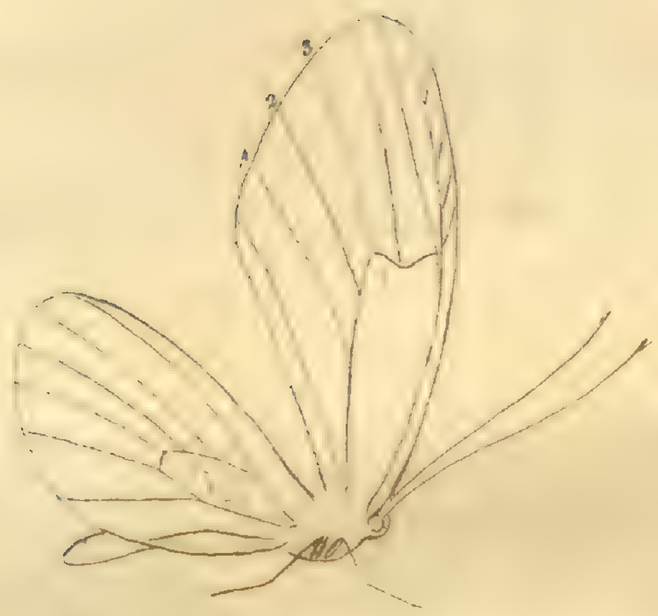
—with upper wings pointed at the extremity, and long in proportion to their width.

—upper wings leſs extended, and together with their under wings more rotund, with their margins entire.

Thus far nearly agreeable to Linnæus; yet there remain a few that cannot (if the foregoing directions are ſtrictly attended to) be ranked with any diviſion before mentioned,; for which it is neceſſary to invent a new term, and to arrange ſeparately, immediately after the Equites, as partaking more of that diviſion than any other. I therefore call them.

ROMANI.

By ſo doing I take from the Equites all that have filiform antennæ. Their characters ſtand thus: Size in general large, without an abdominal groove; no connecting nerve; their antennæ generally acuminated; the veins of both upper and under wings going from their root to the extremity, nearly in ſtraight lines. To this diviſion I bring from Linnæus's Equites, Leilus, Orontes, and Patroclus; and from Fabricius's Danai Feſtivi—Licas, Syphax, Evalthe, and Cochrus, and a few others not yet deſcribed. Theſe few remarks can leave no doubt to what diviſion any Papilio ſhould be referred. The connecting nerve is the moſt important character of all.



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		Equites, fig. 1.	Romani, fig. 2.	Heliconii, fig. 3.	Danai, fig. 4.	Nymphales, fig. 5.	Plebeii rurales, fig. 6, 7.	Plebeii urbicolæ, fig. 8, 9.
ANTENNÆ	clubbed	—		—	—	—	—	
	uncinated or crooked							—
	acuminated or filiform		—					
PALPI	projected				—	—		
	a brush	—						
ALÆ	superiores 3 nerves			—	—	—	—	—
	4 nerves	—						
	nerves nearly in straight lines		—					
ALÆ	inferiores, with a groove				—	—	—	
	slightly grooved			—				
	no groove	—	—					—
	with a connecting nerve	—		—	—			
	without a connecting nerve		—			—	—	—
THORAX and ABDOMEN	slender						—	
	short, thick or broad							—

See TAB. VIII.

IX. *Descrip-*

IX. *Descriptions of several Species of Pancratium. By Richard Anthony Salisbury, Esq. F. L. S.*

Read Nov. 1, 1791.

SEX Pancratii species apud nostrates cultas, non solummodo ab auctoribus invenio confusas, verum enimvero earum characteres communes in differentiâ specificâ adductos; quas ergo iterum adumbrare necnon paulo fusius describere, operæ pretium videtur.

Maritimum. Tab. 9.

1. P. foliis linearibus glaucis: corollæ tubo cylindraceo, *superne angulato;* laciniis tubo brevioribus, patenti-recurvis, lineari-lanceolatis, basi *coronæ adnatis:* coronæ sinubus *grosse 2-dentatis.*

Pancratium maritimum. *Cav. Ic. v. i. p.* 41. *f.* 56. *mala.* Pancratium verecundum. *Soland. in Ait. Hort. Kew. v. i. p.* 412. Pancratium maritimum. *Linn. Sp. pl. ed.* 2. *p.* 418. Pancratium carolinianum. *Linn. Sp. pl. ed.* 2. *p.* 418. Lilio-narcissus polyanthos, &c. *Catesb. Hist. Carol. v.* 2. *append. p.* 5. *t.* 5. Hemerocallis valentina. *Clus. Hist. pl. lib.* 2. *p.* 167. *cum Ic.*

Sponte nascentem infra *Montpellier* littoribus arenosis abunde legi anno 1786.

Floret fine *Julii*, *Augusto.*

Planta 1½-pedalis. Folia 6 vel 7, 2-faria, basi ipsâ vaginantia, erecto-patentia, plus minus tortuosa, linearia, integerrima, obtusa,

L. maximum

P. amœnum

utrinque glabra cum rore aliquo, paululum ſtriata, planiuſcula, carnoſa. Flores ſuaveolentes. Faſciculus 6-10-florus. Pedunculus 1, dilute glaucus, ab uno latere inter folia radicalis, erectus, compreſſus, obtuſus nec anceps, lævis. Bracteæ congenerum. Germen pedicellatum, ovale, 3-gonum. Corolla—Tubus dilute viridis, cylindraceus, ſuperne ungulatus—Limbus niveus, tubo paulo brevior, patenti-recurvus: Laciniæ diſco uſque ad medium coronæ adnatæ, lateribus inferne reflexis, lineari-lanceolatæ, integerrimæ, obtuſe mucronatæ—Corona (Nectarium Linn.) nivea, limbo paulo brevior, infundibuliformis, apice patula, ſinubus groſſe 2-dentata—lævis, marceſcens. Filamenta breviſſima, vix dentibus coronæ altiora, incurva, ſubulata.

Cultum rariſſime floret: iconem noſtram ſub ſole ardente incommode delineavi; pleraſque notas fideliter exhibet, attamen rudis eſt, & parum admodum mihi placens.

Amœnum. Tab. 10.

2. P. foliis lanceolatis, glabris: corollæ tubo teretiuſculo *denſe ſtriato;* laciniis tubo longioribus, recurvis, linearibus, *æqualiter concavis:* coronæ ſinubus *ligulâ 2-fidâ.*

Pancratium exciſum. *Linn. fil. MSS.* Pancratium declinatum. *Jacq. Hort. Vind. v.* 3. *p.* 11. *t.* 10. Narciſſus americanus, &c. *Commel. Hort. Amſt. v.* 2. *p.* 173. *t.* 87.

In *Guiana* forte ſpontaneum.

Floret bis anno, cito poſt *æquinoctia.*

Planta 2-pedalis. Folia 9—12, viridia, 2-faria, baſi ipſâ vaginantia, recurva, lanceolata, integerrima, obtuſiuſcula, utrinque glabra tenue ſtriata, canaliculata, baſi carinata, carnoſa. Flores fragrantes. Faſciculus 10-15-florus. Pedunculus 1, dilute glaucus, inter folia interiora, quibus paulo brevior, radicalis, primo erectus, poſt floreſcentiam deflexus, valde compreſſus ancepſque, glaber cum rore, ſtri-

ſtriatulus, ſolidus. Bracteæ congenerum. Germen læte viride, ſeſſile, ovale, 3-gonum, glabrum. Corolla—Tubus dilute viridis, 2½-pollicaris, teretiuſculus, denſe ſtriatus—Limbus niveus, tubo ⅓ longior, recurvus: Laciniæ ſubæquales, lineares, integerrimæ, obtuſe mucronatæ, expanſione æqualiter concavæ, lateribus baſeos paululum conduplicatæ—Corona nivea, limbo paulo plus quam ⅔ brevior, infundibuliformis, baſi tubo contractior, ſinubus in ligulam ſæpius 2-fidam producta, rugoſula, tenuis, lævis, marceſcens. Filamenta coronâ bis altiora.

Cum plures ſpecies pedunculo in fructu æque declinato gaudent, nomen Jacquinianum non retinui.

Fragrans. Tab. 11.

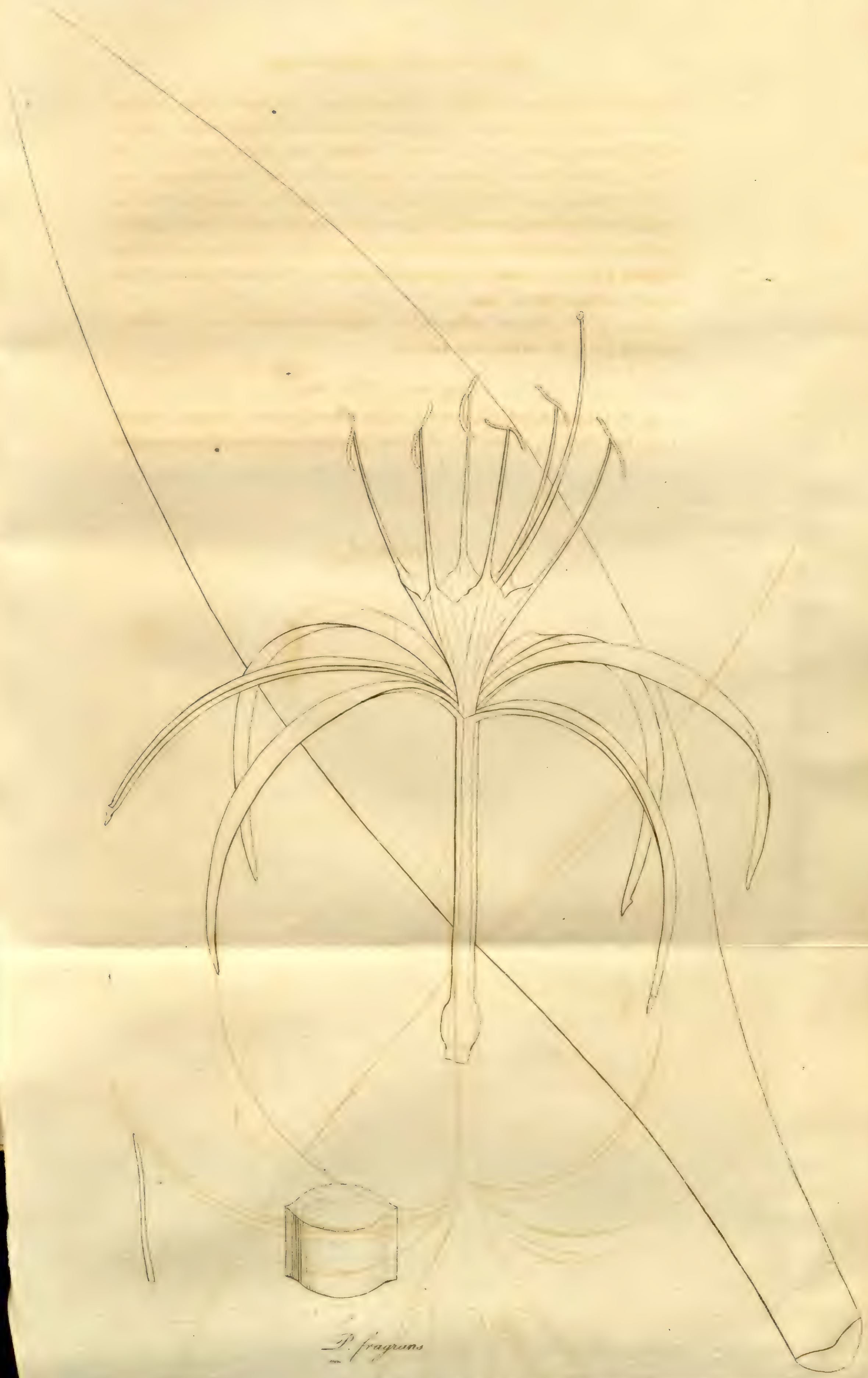
3. P. foliorum petiolis *latis*: corollæ tubo 6-*angulo*, *eſtriato*; laciniis tubo longioribus, *recurvis*, linearibus, alternis concavioribus: coronæ ſinubus repando-emarginatis.

Narciſſus totus albus latifolius, &c. *Mart. Decad. p.* 27. *cum Ic.?*
Narciſſus totus albus latifolius, &c. *Sloan. Hiſt. Jam. v.* 1. *p.* 244?

Ex Inſ. *Barbadoes* ſæpius accepi.

Floret circa *æquinoctia.*

Planta 1½-pedalis. Folia 7—10, viridia, 2-faria—Petioli lati, baſi vaginantes, patentes, ſemiteretes—Laminæ petiolis multo longiores, recurvæ, lanceolatæ, integerrimæ, obtuſæ, paululum canaliculatæ—glabra potiſſimum ſupra, carnoſa. Flores valde fragrantes. Faſciculus 7-12-florus. Pedunculus 1, dilute glaucus, inter folia interiora, quibus paulo brevior, radicalis, poſt floreſcentiam verſus terram deflexus, compreſſus, anceps, glaber cum rore, ſtriatulus, ſolidus. Bracteæ congenerum. Germen læte viride, breve pedicellatum, ovale, 3-gonum, glabrum cum rore. Corolla—Tubus dilutiſſime viridis, 2½-pollicaris, 6-angulus angulis alternis anguſtioribus, non ſtriatus ut in aliis—Limbus niveus, tubo ¼ longior, recurvus: Laciniæ lineares,



P. fragrans

Linn. Trans. II. vol. 12. p. 7a.

P. speciosum.

lineares, integerrimæ, obtuſe mucronatæ, exteriores parum angustiores et multo concaviores—Corona nivea, limbo $\frac{2}{3}$ brevior, infundibuliformis, baſi tubo contractior, ſinubus repando-emarginata, quandoque attamen in ligulam 2-fidam producta more præcedentis, rugoſula, tenuis—lævis, marceſcens. Filamenta coronâ $\frac{1}{4}$ altiora.

Ex ſynonymis citatis dubiis, et Commeliniano quod antecedentis, ſuum *Pancratium caribæum* propoſuit Linné.

Specioſum. Tab. 12.

4. P. foliorum petiolis *anguſtis*: corollæ tubo 3-*angulo rare ſtriato*; laciniis tubo longioribus, *patenti-recurvulis*, linearibus, alternis *concavioribus*; coronæ ſinubus *ligulâ 2-fidâ*.

Pancratium ſpecioſum. *Linn. fil. MSS.*

Floruit hactenus in noſtro caldario tantum menſe *Octobris*.

Planta 1 $\frac{1}{2}$-pedalis. Folia 9—12, viridia, 2-faria—Petioli anguſti, baſi dilatatâ vaginantes, recurvi, lineares, ſemiteretes, ſupra plani—Laminæ petiolis 3-plo longiores, recurvæ, lanceolatæ, integerrimæ, obtuſæ, ſtriatæ, concaviuſculæ, verſus baſin carinatæ—ſupra glabra, ſubtus lævia, carnoſa. Flores fragrantes. Faſciculus 11-15-florus, denſus. Pedunculus 1, dilute viridis, inter folia inferiora quibus paulo brevior radicalis, multo latior quam in aliis, ſub floreſcentiâ erectus, poſtea declinatus, compreſſus, altero latere planiore, anceps, glaber, tenuiſſime ſtriatulus, ſolidus. Bracteæ interiores valde latæ, cæterum congenerum. Germen pedicellatum, ſubovale, 3-angulum, glabrum. Corolla—Tubus 3-pollicaris, cylindraceus, 3-angulus, rare ſtriatus, melle inundatus—Limbus niveus, tubo $\frac{1}{2}$ longior, patenti recurvulus: Laciniæ latitudine ſubæquales, lineares, integerrimæ, exteriores longiores & concaviores, magiſque mucronatæ—Corona nivea, limbo 2 $\frac{1}{2}$ brevior, infundibuliformis, baſi tubo contractior, medio ſinuum in ligulam cuneiformem ſæpius 2-fidam producta, rugoſula, tenuis—lævis, marceſcens. Filamenta corónâ 1 $\frac{1}{6}$ altiorá.

Dignoscas primo intuitu latitudine bracteearum interiorum.

Littorale. Tab. 13.

5. P. foliis lineari-lanceolatis, glabris: corolla tubo 3-angulo, 7-8-*pollicari*; laciniis tubo brevioribus, basi coronæ *adnatis*, recurvis, linearibus; coronæ sinubus *repandis*.

Pancratium littorale. *Jacq. Hort. Vind. v.* 3. *p.* 41. *t.* 75. *bona.* Pancratium littorale. *Jacq. Hist. Amer. p.* 99. *t.* 179. *f.* 94. Pancratium foliis ensiformibus, &c. *Trew Pl. Select. p.* 6. *t.* 27. *bona.*

Sponte nascentem in Ins. *Tierra Bomba*, littoribus arenosis copiose legit Nic. Jos. Jacquin.

Floret *Octobri, Novembri.*

Planta 3-pedalis vel plus. Folia 9-12, bifaria, basi ipsâ vaginantia, erecto-recurva, lineari-lanceolata, integerrima, obtusiuscula, utrinque glabra, convexa, versus basin carinata, carnosa. Flores fragrantes. Fasciculus 7-10-florus. Pedunculus 1, dilute glaucus, inter folia inferiora quibus paulo brevior radicalis, sub floreseentiâ erectus, postea declinatus, compressus, anceps, glaber cum rore cæsio, striatus, solidus. Bracteæ congenerum. Germen sessile, oblongum, 3-gonum, glabrum. Corolla—Tubus dilute viridis, 7-8-pollicaris, obsolete 3-gonus, striatulus—Limbus niveus, tubo $\frac{1}{3}$ brevior, recurvus: Laciniæ subæquales, lineares, integerrimæ, obtuse mucronatæ, basi coronæ adnatæ, concavæ—Corona nivea, limbo $\frac{2}{3}$ brevior, infundibuliformis, basi circiter diametro tubi, apice late patens, sinubus repanda vel erosa, rugosula, tenuis—lævis, marcescens. Filamenta coronâ $1\frac{1}{4}$ altiora.

In *Sp. Pl.* cum sequente mixtum: hinc et quibusdam *Pancratium illyricum* male audit.

Stellare. Tab. 14.

6. P. foliis *spatulæformibus* glaucis: corollæ tubo 3-angulo; laciniis tubo *longioribus*, patentissimis, *lanceolatis*: coronæ sinubus profundè 2-fidis, in *stellam* patentissimis.

Pan-

P. littoralis.

L. stellare

Pancratium illyricum. *Linn. Sp. Pl. ed.* 2. *p.* 418. Pancratium ſpatha multiflora, &c. *Ph. Mill. Ic. v.* 2. *p.* 32. *t.* 97. Narciſſus illyricus liliaceus. *Seb. Theſ. v.* 1. *p.* 17. *t.* 8. *f.* 1. Lilio-narciſſus Hemerocallidis valentinæ facie. *Cluſ. Hiſt. Pl. lib.* 2. *p.* 167. *cum Ic.*

Sponte naſcitur prope *Rochelle* littoribus arenoſis ſecundum Moriſon.

Foliatur *Aprili.*

Floret *Junio.*

Defoliatur fine *Auguſti.*

Planta pedalis vel plus. Folia ſæpius 6, glauca, 2-faria, baſi infra terram vaginantia, erecto-recurva, anguſte ſpatulæformia, integerrima, obtuſa, glabra cum rore, tenuiſſime ſtriata, concava, ſucculentula. Flores ſuaveolentes. Faſciculus 7-15-florus. Pedunculus pallide glaucus, inter folia ab uno latere radicalis, ſolitarius, quandoque ex diverſâ axillâ alter, erectus, admodum compreſſus et anceps, in fructu declinatus. Germen pedicellatum, ovale, 3-angulum. Bracteæ congenerum. Corolla—Tubus dilute viridis, 3-angulus—Limbus albus, tubo longior, patentiſſimus: Laciniæ lanceolatæ, planiuſculæ, interiores anguſtiores—Corona alba fundo flaveſcente, in ſtellam pulchre expanſa, baſi tubo contractior, limbo multo brevior, ſinubus profunde 2-fida—lævis, marceſcens. Filamenta coronâ circiter duplo altiora.

Sub dio læte viget et floret.

X. *Some Account of the Muſca Pumilionis of Gmelin's Edition of the Syſt. Naturæ. By William Markwick, Eſq. F. L. S. With additional Remarks by T. Marſham, Eſq. Sec. L. S.*

Read Nov. 1, 1791.

EARLY in the courſe of the laſt ſpring ſome fields of wheat in the neighbourhood of Battle appearing to be much blighted, a friend of mine diſcovered it to be cauſed by a ſmall inſect of the grub or caterpillar kind, lodged in the centre or very heart of the ſtem, juſt above the root. About the latter end of March I procured ſome of the wheat, examined it, and found in moſt of it a ſmall larva or caterpillar alive; but in ſome it was already changed into the chryſalis ſtate.

Being exceedingly anxious to determine the ſpecies of this apparently deſtructive animal, I planted ſome of the diſeaſed roots in my garden under a hand glaſs, where they flouriſhed very much, and threw out ſtrong ſhoots on each ſide (the middle ſhoot withered); but whether the flies eſcaped through ſome hole in the glaſs, or whether they were devoured by a colony of ants which made their neſt under the glaſs, I cannot tell, as I did not ſucceed in this attempt; for when I pulled up the wheat and examined it, there was an empty chryſalis in each plant. However, I had better luck in my next attempt: I placed ſeveral of the diſeaſed roots of the wheat in a ſmall flower-pot filled with bran, and covered it over cloſe with gauze, in ſuch a manner that no inſect could get in from

the

the outſide, nor could any eſcape from within. On the 14th of May three ſmall flies were diſcovered ſitting on the inſide of the gauze. [See tab. 15. fig. d, D.] A few days after three more of the ſame flies appeared; there were in the flower-pot of bran ſix roots of diſeaſed wheat, which produced ſix flies: on examining the roots afterwards, I found an empty ſhell of the chryſalis in each, ſo that I think there can be no doubt of the identity of the inſect in queſtion.

I mentioned that the larva and chryſalis were always found depoſited on the principal ſtem juſt above the root. This ſtem it invariably deſtroyed, which gave the crop a moſt diſaſtrous appearance, ſo that there was ſcarcely a hope of any produce: but after the larva had changed into its chryſalis ſtate the miſchief ceaſed, and the root was not ſo materially injured as to prevent its throwing out freſh ſhoots on each ſide, or ſtocking itſelf as the farmers term it; as I experienced by thoſe which I planted in my garden.

In ſhort, at harveſt time I was moſt agreeably ſurpriſed to find a good crop of wheat, and the ears large and fine throughout the whole field. My friend thinks it the beſt crop on his farm, and ſuppoſes he ſhall have about three quarters and a half of threſhed corn from each acre.

I hope ſome other gentlemen of the Linnean Society have had opportunities of making their obſervations upon this ſubject. I do not pretend to any very great ſkill in Entomology; I only relate facts, and have endeavoured to be very accurate in ſtating them.

During my obſervations upon this inſect, a variety of thoughts ſuggeſted themſelves to my mind. It was hinted to me, that poſſibly this was what has been called the Heſſian fly, whoſe depredations in America have been ſo notorious. If ſo, a little good Engliſh huſbandry, by keeping the ground in heart, and thus enabling the wounded ſhoots to repair themſelves by ſtrong lateral ones, prevents our being alarmed to ſo great a degree. I had my doubts how and

what

what time the egg of the caterpillar was introduced into the field. It was imagined it might have been carried on in the manure; but the only manure applied to this field was lime, and I do not underſtand that to be the receptaculum of any of the genus of muſca. The kind of wheat ſown was a white wheat, lately introduced here from Surry: my friend could not recollect with certainty its name, but thought it was called white Zealand wheat. None but what was ſown early, about the latter end of September, or the beginning of October, was affected by this inſect; and in one field, where a part of it was early ſown with white, and the other with red wheat at the ſame time, the white wheat was much affected, and the red but very little. The reaſon why the early-ſown wheat only was affected is, I ſhould imagine, becauſe the cold at the approach of winter deſtroyed the fly before the late-ſown wheat was ſprung out of the ground: conſequently it could not lay its egg in that.

The ſoil is rather ſtiff with a gravelly bottom. I ſhall be very glad to meet with the obſervations of ſome other of our ſcientific friends. I can ſcarcely flatter myſelf that our inveſtigation of this inſect will be productive of ſo much benefit to the public, as to find out a remedy for the evil by deſtroying it effectually; but it is with ſome ſuch view that I trouble the Society with theſe obſervations.

I have made as accurate a drawing as I was able of the inſect in all its ſtages of growth, and the ſituation in which it is found in the principal ſhoot or ſtem of the plant.

CATSFIELD,
Aug. 29, 1791.

EXPLANATION of TAB. 15.

a. The caterpillar of its natural ſize, as it is found in the centre of the green wheat juſt above the root.

b. The pupa in the ſtem.

c. The pupa of its natural ſize. C. the ſame magnified.

d. The fly of its natural ſize. D. the ſame magnified.

E. The wing magnified.

IN

Musca pumilionis.

IN addition to the foregoing accurate and valuable obſervations of Mr. Markwick, it may not be improper to obſerve, that the larva of this fly was ſent ſeveral months ſince, with ſome of the roots of wheat that were attacked, to Arthur Young, Eſq. who being apprehenſive that they were the larva of the Heſſian fly, ſent the roots of wheat to Sir Joſeph Banks, encloſed in a glaſs phial, for his opinion. Upon examination, it was found that the inſect was ſtill in the ſtem or principal ſhoot of the plant, in its pupa ſtate. Theſe being carefully preſerved, the fly appeared in a few days; and Sir Joſeph Banks determined it to be the Muſca Pumilionis of Gmelin's Syſtema Naturæ, and by letter communicated this information to Mr. Young, accompanied with an engraving of the fly, both of which were publiſhed in the 91ſt number of the Annals of Agriculture.

The following deſcription of the fly is given by Gmelin, taken from the Swediſh Tranſactions.

Muſca Pumilionis—nigra, ſubtus, capite, thoraciſque duabus lineis flavis, halteribus albis, pedibus cinereis apice nigris.

Habitat, larva, capite acuto apice nigro, in Secalis culmis adeo incremento eorum noxia, ut vix 1, 2, 3 pollicum altitudinem aſſequantur.

An account of this fly and its deſtructive properties was firſt publiſhed in the Tranſactions of the Royal Academy of Sciences at Stockholm for the year 1778, by Mr. Ol. Bjerkander, who diſcovered it on the young ſhoots of the rye in the month of May, at the lowermoſt joint, which ſtopped the growth of thoſe ſhoots, and made them appear as dwarfs; which circumſtance ſuggeſted the name Pumilionis. He deſcribes the larva to be white, two lines in length, compoſed of 10 rings, the head pointed at the end,

end, black, and reſembling a V. They paſſed into their pupa ſtate the 25th of the ſame month. The pupa was yellow, ſhining, rather more than one line in length, and compoſed of rings.—The flies appeared the 12th of June and the following days; the perfect animal is well deſcribed above.

At what time theſe eggs are depoſited in the rye, that gentleman obſerves, is not yet determined. The larvæ were ſmall on the 23d April, and full grown the 25th May: on the ſides of the ſtems were ſeen no holes, from whence he conjectures that the eggs or larvæ muſt enter at the top of the leaves. The fly, when hatched, forces its way upwards, and flies out of its neſt.

The dwarf ſtems Mr. Bjerkander obſerved began to grow yellow and decay the 14th June, and were in ſuch abundance, that in ſome fields, 8, 12, or 14, were found in a ſquare of two feet; from whence he concludes that great injury is done to the rye, and ſtrongly recommends that the ſtems ſhould be pulled up and burnt, while the inſect is in the larva or pupa ſtate; and by this means he thinks one or two perſons might deſtroy many thouſands of them in a day, he himſelf having picked up 350 ſtems in a few hours.

It will certainly be a pleaſing ſatisfaction to the public in general, and to the farmer in particular, to know, that this inſect is not the Heſſian fly of America; and alſo, from the careful experiments of Mr. Markwick, to find that its deſtructive properties are not of that magnitude as were at firſt apprehended, or as Mr. Bjerkander ſuppoſed; though perhaps an increaſe of the fly may render it a formidable enemy. It is therefore much to be wiſhed, that ſuch gentlemen as have leiſure and opportunity would pay ſome attention to this ſubject, and, with Mr. Markwick, purſue his experiments with a view to diſcover all the particular properties and natural œconomy of this animal. Now, as this fly is bred here ſo early as May, it is probable there is more than one brood in the year; for having been favoured with two or three of the flies by Sir Joſeph Banks,

Banks, I find that they are not uncommon, having frequently found them in autumn on umbelliferous plants; and inſects of this order ſeldom live ſo long in their perfect ſtate, and are rarely ſeen abroad ſo late in the year as the latter end of October: indeed, if there are two breeds in the year, a queſtion will ariſe, upon what plant is the ſecond brood nouriſhed? for wheat ſown the latter end of September, or the beginning of October, muſt be ſome time before it appears above ground. And yet I cannot believe that the egg is carried there either by manure or by any other means than by the parent fly, from this ſingular property, that only one larva is found on each plant, and that always in the principal ſtem; for although the Muſcæ in general depoſit a number of eggs in one ſpot, it is always where plenty of food is at hand to nouriſh the young larvæ immediately on their being hatched. I am therefore deſirous to offer the following hints for obſervation, hoping that ſome gentleman will take up the ſubject, and examine it ſtill more cloſely. When it appears evident that a fly has attacked a field of wheat, rye, &c. watch carefully the animal through all its ſtages, but more eſpecially when the fly takes wing, obſerving on what plants it ſettles, and whether it is partial to any particular plant; and if this can be determined with preciſion, attend to ſee it depoſit its eggs, carefully examining whether it lays more than one at a time. If afterwards the larvæ appear on thoſe plants, obſerve in what manner they feed, continuing the remarks till the perfect inſect appears, when it muſt be again watched with attention, and traced to its next place of depoſiting its eggs, to determine whether wheat or rye be its natural food in ſpring, or whether its attack on theſe plants be only in particular ſeaſons when its own natural food may have failed; for Mr. Markwick takes notice, that it was only the early ſown wheat that was affected.

From the foregoing obſervations of Mr. Markwick, that the

diſeaſed plants, inſtead of being loſt, produced a number of lateral ſhoots, and the crop in the field of wheat in which the fly had made ſome havock turned out exceeding well, it follows that Mr. Bjerkander's advice of picking up and burning the ſtems that are infeſted, would be highly prejudicial; but perhaps pinching the central leaves, juſt above the crown of the root, where the inſect is uſually found, might effectually deſtroy it, and leave the plant in a ſtate to throw out its lateral ſhoots. If, however, a method could be diſcovered to deſtroy the parent animal, it would certainly be the moſt efficacious.

Nov. 1, 1791

THOMAS MARSHAM.

XI. *De-*

XI. *Deſcription of Paſpalum ſtoloniferum. By Mr. Louis Boſc, F. M. L. S.*

Read Dec. 6, 1791.

P. Spiculis ſpicatis, rachi undulata, floribus alternis ſecundis, caule geniculato; baſi proſtrato ſtolonifero.

H. in Perua.

Graminée vivace, à chaume ſolide.

Racine fibreuſe, blanchâtre.

Tige rameuſe, articulée, flexueuſe, glabre, cylindrique, procombante à la baſe, haute de deux pieds, fourniſſant des racines par ſes neuds. Rameaux alternes.

Feuilles vaginées, lanceolées, glabres, legerement ſtriées, un peu ondulées en leurs bords, ſouvent longues de trois pouces et larges de 8 lignes.

La gaine un peu plus courte que l'entreneud où elle ſe trouve, ſtipulée et rougeatre à ſon ſommet. Chaque gaine renferme preſque toujours outre la tige qui lui appartient le bourgeon d'une nouvelle tige, qui ſe dévelope à ſon tour. Stipule très-court, cilié, blanchâtre.

Epi terminal, ſimple, de la longueur de 5 à 6 pouces.

Pedoncule commun rachidiforme, alterne, membraneux, undulé, cilié en ſes bords, long de 7 à 8 lignes et largé d'une ligne, portant ſur ſa face inférieure juſqu'à 18 fleurs alternes et diſtiques.

Pedoncule propre applati, à peine long d'une ligne.

Calice de deux valves égales, rougeatre. Les valves ovales, oblongues, ciliées à la pointe, fortement ondulées fur les côtés, principalement à la baſe. La ſupérieure convexe, l'inférieure concave.

Corolle de deux bales égales, ovales, membraneuſes, incolorées, un peu moins longues que le calice. La ſupérieure convexe, l'inférieure concave.

Etamines au nombre de trois, filaments attachés à la baſe du germe et deux fois plus longs que la corolle; antheres alongées, dydimes, rubeſcentes.

Piſtil. Germe oval, très-petit, très-glabre. Deux ſtiles de la longueur de la corolle. Stigmates à peu près de la même longueur, blancs et extrêmement hériſés. Ils ſortent et ſe recourbent des deux côtés de la fleur au moment de la fécondation.

Semence unique, recouverte par la corolle et de même grandeur et couleur qu'elle. Elle eſt tronquée de braies au ſommet du côté convexe et un peu ſulcée du côté applati. La ſubſtance eſt cornée, demi-tranſparente.

Ce graminé ne s'écarte des caractères du genre de Paſpalum de Linnéus que parce qu'il a la corolle plus courte que le calice, et les filaments plus longs que la fleur. Il eſt originaire du Pérou, d'où il eſt paſſé en Eſpagne. MM. Boutelou frères, qui en ont reçu la ſemence de leur père jardinier du Roi à Aranjués, l'ont cultivé avec ſuccès à Paris. Les ſemences qu'ils ont recoltées étoient en partie avortées; mais cette plante étant vivace, et ſes neuds pouſſant facilement des racines lorſqu'ils ſont couchés ſur la terre, nous avons eſpérance de la conſerver de drageons. Elle paroît propre par la hauteur et la multiplicité de ſes tiges, par la largeur de ſes feuilles, et par la ſucculence de toutes ſes parties à ſervir de fourrage.

EXPLI-

Linn. Trans. II. *tab.* 16. *p.* 85.

Paspalum stoloniferum.

Explication de la Planche, Tab. 16.

A. Le Paſpalum ſtoloniferum de grandeur naturelle.

B. Un epillet de grandeur naturelle vu en devant.

C. Le même groſſi.

D. Le même vu par derrière.

E. Un pedoncule commun groſſi.

F. Une fleur epanouie attachée au pedoncule commun.

G. Le calice vu en deſſus.

H. Le même vu en deſſous.

I. La corolle.

K. Le piſtil et les étamines.

L. La ſemence vue en deſſus.

M. La même vue en deſſous.

XII. *Obſervations on the Structure and Oeconomy of ſome curious Species of Aranea. By Mr. Dorthes, F. M. L. S.*

Read Jan. 3, 1792.

COMME l'Araignée aviculaire (Aranea avicularia L.), qu'on nous porte d'Amérique ſous le nom d'*Araignée crabe*, eſt la plus groſſe eſpèce que nous connoiſſions de ce genre d'inſectes, & que chez elle les parties ſont très developées; j'ai profité de cette circonſtance pour examiner plus facilement les caractères génériques des araignées fondés ſur les parties de la bouche ſuivant le ſyſtême entomologique de Mr. FABRICIUS, ce qui m'a donné lieu d'examiner auſſi les parties génitales du mâle, qui, d'après pluſieurs obſervateurs, ſont placées ſur les antennules.

Ma première ſurpriſe a été de ne trouver dans aucun individu les machoires, *maxillæ**, qu'on obſerve pourtant dans la plûpart des autres eſpèces. J'ai vu à leur place un article qui dans d'autres eſpèces ſert de baſe aux antennules & aux machoires en même tems, & qui ne differe dans celle-ci des premiers articles des pattes, qu'en ce que la partie antérieure a un angle moins arrondi & moins velu.

J'ai voulu voir ſi d'autres araignées me preſenteroient le même caractère; je l'ai retrouvé dans *l'araignée maçonne*, que je décrirai ci-

* Nous prenons ici ce môt dans le ſens que lui donne Mr. FABRICIUS, qui diſtingue les machoires d'avec les mandibules.

deſſous,

deſſous, & dans quelques autres eſpèces qui par leur configuration externe ſe rapprochent de l'*araignée aviculaire*. Afin qu'on puiſſe comparer la différence qui éxiſte à cet égard entre l'araignée aviculaire & les autres eſpèces, je joins ici des figures des parties de la bouche de l'*araignée aviculaire* & de l'*araignée domeſtique* (tab. 17. figure I. & III.)

Je conclus de cette première obſervation, que la préſence des machoires ne peut point être compriſe dans les caractères génériques des araignées, & qu'à cet égard la méthode de Mr. FABRICIUS peut être rectifiée, quoique d'ailleurs elle ſoit la plus ſûre que nous connoiſſions juſqu'à préſent pour nous conduire à la connoiſſance des familles naturelles.

J'ai vu enſuite preſqu'à l'extrémité des crochets des mandibules (fig. I. lettre b.) une ouverture eſſentielle qui a échappé aux obſervations de la plûpart des entomologiſtes modernes. On peut voir ce qu'ont dit à ce ſujet dans l'*Encyclopédie méthodique*, MM. MAUDUIT & OLIVIER, qui avouent que malgré toutes leurs recherches, ils n'ont pu trouver aucune ouverture ſur ces parties (voyez l'*Encyclop. méthodique. Inſectes* au môt *Araignée*, pag. 186, & dans les diſc. prélim.). SWAMMERDAM lui-même, qui a porté tant de ſcrupules dans l'anatomie des inſectes, dit auſſi qu'il n'a pu voir aucune iſſue ſur les mandibules des araignées (voyez *Biblia naturæ*, p. 49). Mr. GEOFFROY les a cependant apperçues: il n'en a parlé, à la vérité, qu'en paſſant, mais aſſez pour nous faire comprendre qu'il les connoiſſoit bien ; voici tout ce qu'il en dit. "Ces mêmes pointes lui ſervent auſſi de bouche; " quoique leur extrémité ſoit fort aigue, elle eſt cependant percée vers " le bout, & le dedans des tenailles eſt creux, en ſorte que l'araignée " ſucce par là les humeurs de la mouche ou de tel autre inſecte " qu'elle a ſaiſi."—(*Hiſt. abrég. des Inſectes*, t. 2. p. 632.) C'eſt ſans doute à cauſe de leur analogie avec celles d'autres inſectes qui ne ſe nourriſſent qu'en ſucçant avec des inſtrumens de cette forme, que Mr. GEOFFROY penſe de cette manière; mais il n'eſt point aſſuré que

que cela ſe faſſe ainſi; j'ai vu pluſieurs fois des araignées avaler peu à peu des inſectes dont ils rejettent quelques fois les débris en pelotte après les avoir conſervés pendant quelques momens dans l'intérieur de la bouche. D'un autre côté, j'ai ſouvent irrité avec la lame d'un couteau de groſſes araignées telle que la Tarantule (*Aranea Tarantula* L.) que nous avons ici très-commune dans les champs arides; en pinçant le tranchant de la lame, elles laiſſent échapper très-promptement, par l'extrémité des mandibules, des gouttelettes d'une humeur limpide ſans couleur que je me ſuis aſſuré être leur venin, comme je le rapporterai ailleurs. Il y a donc apparence que ces ouvertures ne ſont deſtinées qu'à laiſſer échapper le venin de l'araignée. Elles ſont allongées, & ſe trouvent chacune à la partie antérieure de l'extrémité du crochet au point déſigné dans la figure I. par la lettre b.

Après avoir reconnu l'emplacement de ces ouvertures dans l'*araignée aviculaire*, il ne m'a point été difficile de les retrouver dans les autres eſpèces de ma collection, & il n'en eſt aucune chez qui je n'ai pu la voir par le ſecours d'une forte loupe.

Quant aux antennules de l'*araignée aviculaire*, voici ce qu'elles m'ont preſenté de ſingulier.

Elles ſont compoſées dans les mâles d'un article de plus que dans les femelles. C'eſt dans cet article que ſont contenues, à ce qu'on croit, les parties génitales, dont on n'a point déterminé juſqu'à préſent la conſiguration. Il eſt preſque rond & placé à l'extrémité de l'antennule; il a en deſſous une rainure au milieu de laquelle ſe trouve logé un crochet conſidérable qui jouit d'un mouvement de charnière. Lorſque l'articulation eſt fermée, le dos du crochet ſe loge dans une autre rainure ſituée en deſſous du ſecond article. La figure II. e. donnera une idée de cette ſingulière ſtructure.

Cet article manquant dans les femelles, l'antennule ſe termine chez elles comme les pattes. Voyez fig. I. c. c.

Du reſte on ne peut appercevoir ſur les crochets ni ſur le dernier article de ces antennules aucune ouverture par laquelle puiſſe s'échapper la ſemence ; il faut cependant qu'il y en ait une, s'il eſt vrai, comme on l'a obſervé, que les antennules des araignées mâles contiennent les parties génitales.

Ce dernier article manquant aux femelles des araignées en général, chez elles l'antennule ſe termine comme les pattes, ce qui fournit un moyen de les diſtinguer d'avec les mâles. J'ai obſervé un moyen auſſi ſûr pour diſtinguer les ſexes chez l'araignée aviculaire : c'eſt que la femelle n'a point au cinquieme article de la première paire de pattes les deux crochets immobiles qu'on voit chez le mâle, comme l'indique la figure II. lettre f. f.

J'ai comparé les antennules de l'araignée aviculaire mâle, avec celles de pluſieurs autres eſpèces, j'ai trouvé une grande variété de formes entr'elles dans la partie qu'on a dit contenir les parties ſexuelles. Ces formes pourroient fournir des caractères dans les eſpèces diffi-ciles à diſtinguer. Je me contenterai dans ce moment de donner la deſcription & la figure de l'antennule de l'araignée domeſtique mâle, dont la conformation eſt des plus bizarres.

Le dernier article eſt un ovoide dont la partie la plus étroite eſt très-allongée, & forme l'extrémité. La partie la plus large eſt creuſée en cuillier. Au milieu de la cavité eſt fixé un appendice dont la baſe eſt globuleuſe; il ſe termine par divers prolongemens, dont on peut prendre une idée par les figures III. IV. V. & leurs explications qui y ſont jointes.

Je terminerai ce mémoire par la deſcription de l'araignée maçonne (figure VI.) dont les mœurs ſingulières ont été décrites par Mr. l'Abbé Sauvages dans l'Hiſtoire de l'Académie des Sciences de Paris, mais qui n'a point donné une deſcription ſuffiſante de l'animal, ce qui eſt cauſe que Linne & Fabricius n'en ont point parlé.

Elle reſſemble en petit à l'araignée aviculaire: ſes yeux, placés ſur une verrue au nombre de huit, ont la même diſpoſition (voyez figure VII.): elle a comme elle une cavité tranſverſale au milieu du corcelet, qui cependant eſt un peu plus allongé. Elle manque comme elle de machoires; ſa couleur eſt gris-brun; le deſſus du ventre eſt parſemé de points irréguliers noiratres, diſpoſés en ſix à ſept rangs de chevrons, dont la pointe qui occupe le milieu du dos de l'abdomen ſe dirige vers le corcelet. Elle peut être décrite de la manière ſuivante dans le ſtile Linnéen.

ARANEA SAUVAGESII, *griſeo-brunnea, thorace convexo centro tranſverſe excavato, abdomine ovato atomis atris adſperſo.*

Aux faits nombreux rapportés par Mr. l'Abbé SAUVAGES ſur les mœurs étonnantes de cet inſecte, j'en ajouterai quelques-uns qui ne ſont pas moins intéreſſans.

J'ai trouvé pluſieurs fois dans la même habitation le mâle & la femelle avec une trentaine de petils. On voit par là, qu'elle eſt plus ſociale que la plupart des autres eſpèces, qui ſe dévorent entr'elles. Si cependant on met dans un même vaſe pluſieurs de ces araignées, & qu'on ne leur fourniſſe aucune nourriture, elles s'entretuent, & ſe dévorent.

Le fond de leur habitation contient des débris de diverſes eſpèces d'inſectes, même de coléopteres aſſez gros.

Ce n'eſt que de nuit que ces araignées courent après leur proie, & qu'elles travaillent à leur habitation. Si on fixe avec une épingle l'opercule de terre qui ferme leur demeure, on voit le lendemain, qu'elles ont fabriqué pendant la nuit une nouvelle porte à côté. De même ſi on enleve cet opercule, on en trouve un autre le lendemain à la même ouverture.

EXPLI-

I

II

IV

III

VI

V

VII

Explication des Figures. Tab. 17.

Figure I. Parties de la bouche de l'araignée aviculaire de grandeur naturelle.

a. Mandibules.

b. Extrémité de la pince des mandibules où ſe trouve une ouverture.

c. c. Antennules de la femelle.

d. Première articulation des mandibules, qui, dans pluſieurs eſpèces, ſert de baſe aux machoires qui manquent dans celle-ci.

e. Premier article des pattes.

f. Lévre inférieure.

g. Patte antérieure privée de crochets dans la femelle à l'article noté *, tandis que le mâle en eſt pourvu comme on le voit à la figure II. f. †.

h. Naiſſance du ventre.

Figure II. a. Corcelet de l'araignée aviculaire.

b. Verrue ſur laquelle ſont poſés 8 yeux.

c. Mandibules.

d. Antennules du mâle.

e. Dernier article de l'antennule du mâle portant des crochets qui jouiſſent d'un mouvement de charnière dans une rainure pratiquée dans cette articulation.

f. Patte antérieure du mâle, portant à l'article noté †, deux crochets immobiles qui ne ſe trouvent pas dans la femelle.

g. Naiſſance des pattes.

h. Naiſſance de l'abdomen.

Figure III. Parties de la bouche de l'araignée domeſtique mâle groſſies à la loupe.

a. Machoires.

b. Levre inférieure.

c. c. Antennules.

Figure IV. Les mêmes parties rabaiſſées pour laiſſer voir l'intérieur de la bouche & les mandibules.

a. Mandibules.

b. Corps charnu mameloné, placé dans l'intérieur de la bouche.

Figure V. Extrémité de l'antennule vue encore plus groſſe pour diſtinguer les appendices qui y ſont contenus.

a. Derniere articulation de l'antennule creuſée en cuillier.

b. Appendice ſupporté par un globule fixé dans la cavité.

Figure VI. Araignée maçonne.

Figure VII. Corcelet de l'araignée maçonne deſſiné plus grand que nature pour mieux voir la diſpoſition des yeux.

XIII. *Account of the Germination and Raiſing of Ferns from the Seed. By Mr. John Lindſay, Surgeon in Jamaica. Communicated by Sir Joſeph Banks, Bart. P. R. S. and H. M. L. S.*

Read Jan. 3, 1792.

IT was not generally known many years ago that ferns bore any ſeed, hence the notion of its power of rendering whomſoever poſſeſſed it inviſible*; and it does not appear that the writers on Natural Hiſtory are yet very well acquainted with the real ſeeds of ferns, or from what particular part the young plants are produced. In the *Encyclopedia Britannica*, 3d edition, where good information might be expected, we have this account of the fructification of ferns: "The flowers, whatever be their nature, are, in the greater number of genera, faſtened, and as it were glued to the back of the leaves; in others, they are ſupported upon a ſtem which riſes above the leaves, but in ſome are ſupported on a flower-ſtalk as already mentioned: the ſtamina are placed apart from the ſeed-bud in a genus termed by Mr. Adanſon *Palma filix*: in the other ferns, where we have been able to diſcover the ſtamina, they are found within the ſame cover with the ſeed-bud†." While ſtudying medicine at Edinburgh, I had good opportunities of getting acquainted with the fructification of ferns, under the direction of my worthy friend

* "We ſteal as in a caſtle, cock ſure; we have the receipt of fern-ſeed, we walk inviſible." SHAKESPEARE.

† Vide Filix in the article Botany.

friend and patron Dr. Hope, late profeſſor of botany there. But I did not then learn that any of thoſe parts which I had ſeen were the real ſeeds, or capable of producing new ferns. I underſtood that this point was ſtill uncertain.

When I came to Jamaica, I obſerved great numbers of ſmall young ferns riſing after the rains in marle and gravel pits, and on the ſhaded banks of rivers which had been broken down by the floods; and indeed in every place where the earth had been dug into, and left ſhaded and untouched for a few months, numbers of young ferns of different kinds generally began to appear. This I conſidered as a fair opportunity of aſcertaining from what part the young fern aroſe. I had ſome ſpare time, which with propriety I could dedicate to that purpoſe, being aſſiſtant to my good friend Dr. Clarke, botaniſt for the iſland, and I had the opportunity of a good microſcope. The minuteneſs of the ſeeds rendered every attempt to diſcover them, by ſearching at the roots of even the ſmalleſt viſible plants, entirely fruitleſs. I then thought of ſowing the powder or duſt, which falls from the fern leaves when drying, in a flower-pot, of keeping them in my room, and of obſerving their progreſs. To enable me to do this with eaſe and certainty, I mixed ſome of the powder with ſome of the mould it was to be ſown in, and by the help of the microſcope was ſoon able to diſtinguiſh readily the different parts of the powder, or fructification, from the particles of the mould in which it was ſown. Having collected the duſt of ſome of thoſe ferns which, from the number of their young ones riſing every where, promiſed to grow readily, and ſown it in a pot filled with the ſame kind of mould in which the young ones grew, I placed the pot in a window of my room, watered it daily, and every day or two examined a ſmall portion of the mould by the microſcope. I could always readily diſtinguiſh the duſt or ſeeds from the mould, but obſerved no alteration till

about

about the 12th day after ſowing, when many of the ſmall ſeeds, repreſented at 6 in the annexed plate, had put on a greeniſh colour, and ſome were puſhing out their little germ, like a ſmall protuberance, the rudiment of the new fern, as at 8. This little protuberance gradually enlarged, and ſucceſſively put on the appearances at 9, 10, and 11. They had acquired ſmall roots, and the remains of the little ſeeds were ſtill diſcernible where the roots of the infant plant commenced. Although the young ferns were now very conſpicuous by the microſcope, the naked eye could ſee nothing but a green appearance on the ſurface of the mould, as if it were covered with ſome very ſmall moſs: this was the numberleſs young plants from the quantity of the ſeed ſown. In ſome weeks this moſs began to appear to the naked eye like ſmall ſcales, as at 13, which gradually enlarged, as at 14: they were generally of a roundiſh figure, ſomewhat bilobate, but ſometimes more irregular; they were of a membranous ſubſtance, like ſome of the ſmall *lichens* or liverworts, for which they might readily be miſtaken, and of a dark green colour. At laſt there ariſes from this membrane a ſmall leaf, different from it in colour and appearance, as at 15, and ſhortly after another ſtill more different, as at 16. Now each ſucceeding leaf grows larger than the laſt, till they attain the full ſize, and are complete in all the parts and diſcriminating characters of their reſpective ſpecies. Some of the above obſervations appearing to me new, I communicated them to Dr. Hope. He judiciouſly offered a few queries, founded on the deceptions to which obſervations made by high magnifiers are often liable: theſe I endeavoured to anſwer; he was ſatisfied, and promiſed to lay the obſervations before the Royal Society of Edinburgh.—But that city ſoon after loſt an amiable member of ſociety, and I a friend, whoſe memory will be dear to me while I live. Engaging in the practice of medicine ſoon after, I thought no more of the ſubject, till I had the honour of a

very

very polite letter from Sir Joſeph Banks, Bart. P. R. S. dated March 29, 1789, where, after mentioning ſome other plants, he obſerved that ferns would be particularly acceptable. In anſwer I obſerved, that the riſk of carrying many of the ferns alive ſuch a diſtance was great, and propoſed to ſend ſome of their ſeeds, which, being properly ſown, I had reaſon to believe would grow. He very ſoon informed me that, if I could furniſh the means of making the ferns of this iſland grow in England from the ſeeds, I ſhould have the credit of making a very valuable diſcovery, and requeſted I would ſend him ſome ſeeds, with my notes on this ſubject, by the firſt opportunity. Being now more convinced that the ſeeds, and progreſs of the germination of ferns, were ſtill but little known, I collected the ſeeds of 16 or 18 different ſorts, and ſowed them in a flower-pot in my room, of about 10 inches diameter, each in a ſeparate ſpace, and marked. I kept the pot in my room, and watered them duly. They all appeared between the 10th and 20th day, in the form of a ſmall green moſs on the ſurface, and at length were putting on the membranaceous form, when they were all deſtroyed by being expoſed to the ſun in a dry hot day. I repeated the ſowing of the ſeeds in the flower-pot; and alſo ſowed others in the mouth of a marle pit, ſhaded from the ſun's rays, where no ferns of the ſame kind had grown before. They are all now growing; and thoſe in the flower-pot have made ſome progreſs in the membranous form; and in the marle pit they are beginning to put out the leaves peculiar to their ſpecies.—Having now pointed out the ſeeds, or that part of the fructification, from which the young plants of this beautiful and curious tribe of vegetables, the ferns, ariſe, and ſhown the beginning of their germination and progreſs of their growth; it remains to ſay a few words concerning the gathering and ſowing of their ſeeds.

The ſeeds of ferns may be procured with readineſs and eaſe by

taking thoſe frondes or leaves on which the fructification is copious, fair and conſpicuous; which are of full growth, have a healthy appearance, and are more expoſed to the free air than confined in ſhade. Theſe leaves, laid on clean paper in a dry place, ſoon ſhed their ſeed in the form of duſt or fine powder, of colour varying from black or brown to yellow: the groſſer part of this powder is the empty capſules, and that very fine part which adheres cloſely to the paper is the ſeed. The ſeeds thus procured may be ſown immediately, or kept in paper in a dry place. How long they will retain the principle of vegetation I cannot ſay. I have kept ſome above three months, which grew well enough when ſown; but they ſeemed to be rather longer in vegetating than thoſe freſhly gathered. There are doubtleſs many ſpecies of ferns, which, like other vegetables, require a ſoil and ſituation peculiar to themſelves, yet we often find the ſame ſpecies growing in different ſoils: hence the propriety of attending to the ſoil and ſituation of each ſpecies is pointed out, and at the ſame time there is room left for trying a general medium.—I took equal parts of brick mould and good pit marle, at ſome depth below the ſurface, to avoid the ſeeds of other plants, mixed them well together, and with this filled the flower-pot, moiſtened it properly, and made the ſurface very ſmooth: I then divided it into ſmall ſpaces, according to the number of the different kinds intended to be ſown in it; and laſtly ſtrewed the ſeeds lightly on the ſurface, which may be moiſtened with a little water juſt before they are ſown: they require no covering. They ſhould now be placed in a heat correſponding to that of their native climate, in a place rather moiſt than too dry, freely open to the light and freſh air, but ſo ſhaded that the direct rays of the ſun ſhall not reach them. All ferns ſeem to grow beſt in moiſt and ſhaded places; and although many of them will bear the ſun's rays very well when grown up, few of them, I believe, will do ſo

when very young. They ſhould be daily moiſtened with water in the moſt gentle manner poſſible, and the pot may be kept in a baſon with a little water in it. Great care is requiſite to keep them from all ſorts of vermin: covering the mouth of the pot with a net-work of fine braſs wire anſwered this purpoſe with me.—In about 10 or 15 days, or perhaps later, the ſurface will begin to look green, as if ſome fine moſs were beginning to grow on it: this will gradually increaſe, and the progreſs will be nearly as I have deſcribed.—What relates to the tranſplanting of them, after they have acquired a little ſtrength, will eaſily be judged of by every one accuſtomed to the raiſing and tranſplanting of other plants; and the rearing of them afterwards will be beſt underſtood by attending to the ſoil, ſituation, and climate from which they have come. What ſpace of time may be required between the ſowing of their ſeeds and their acquiring the leaves proper to each ſpecies, I cannot readily point out; in different ſorts it may be different: the ſhorteſt I have obſerved has been almoſt three months, ſometimes more; but this may be varied no doubt by various circumſtances. Having thus given an account of the germination and progreſſive growth of young ferns, it only remains to give ſome deſcription of the fructification, which I ſhall do in a few words, aſſiſted by the annexed drawing.

EXPLANATION of TAB. 18.

Figure 1. repreſents a leaf of the Polypodium lycopodioides, and the dots the little cluſters of fructifications. Each cluſter is gene-rally* covered with a thin membrane or ſcale, commonly called the

* Many, if not moſt ſpecies of the genus Acroſtichum, and this, with ſeveral other ſpecies of Polypodium, want this membrane or calyx. This difference therefore, Flores caliculati, et non caliculati, vel nudi, might be uſeful in diſtinguiſhing the numerou ſpecies of this extenſive genus.

calyx.

Linn. Trans. II. Vol. 18. p. 98.

calyx, and conſiſts of a number of ſmall globules or capſules: each capſule is girt with an elaſtic and apparently articulated ring, which when dry, breaks ſuddenly, rends the capſule, and ſcatters the ſeeds in the form of a fine duſt*.—2. One of the capſules and its elaſtic ring magnified.—3, 4, and 5. Different views of the capſule burſting and diſcharging the ſeeds.—6. The ſeeds highly magnified appearing full of dots, as if they contained another ſeries of bodies within them: this has been alleged as a proof of their not being the real ſeeds.—7. The ſeed burſt by being bruiſed when moiſt, its contents giving the appearance of ſmall grains mixed in a tranſparent mucilage.—8, 9, 10, and 11. Different degrees of progreſs in the germination, to be ſeen only by being highly magnified.—12. A whole capſule prevented from burſting by moiſture, with the ſeeds vegetating, and making their way through it.—13. The firſt appearance of the young fern in the form of a ſmall thin ſcale; theſe may be ſeen by the naked eye.—14. The ſcales gradually becoming larger, and appearing like ſmall *lichens* or liverworts.—15. The firſt appearance of the firſt true leaf of the fern.—16, 17. Ferns with the ſecond and third leaves beginning to take the form of their proper ſpecies.

HAVING now given ſome uſeful additions to the hiſtory of this beautiful tribe of plants, the Ferns, I ſhall conclude with expreſſing my hopes that ſome additional light will ſoon be thrown on the fructification and germination of thoſe curious vegetables the *Muſci* or Moſſes, and others of the claſs *Cryptogamia*, by men of abilities, and ſhall give an inſtance in proof that the hope is

* With the anthera, or what is analogous to it, I am yet unacquainted; it has been ſuppoſed to be the elaſtic ring, but I do not know if with good reaſon.

not ill founded.—I have very lately ſown that fine farina or duſt contained in the anthera of a ſpecies of the genus Bryum, *viz.* Bryum ceſpiticium, or one very like it, and alſo the farina of the Lycopodium cernuum. There is a vegetable growth taking place where they were ſown, which I hope will prove their young plants.—If this ſhould be the caſe, that which has generally been called the anthera, muſt be conſidered as the true capſule or ſeed-veſſel, and the antheræ muſt be ſought for anew.

XIV. *Addi-*

XIV. *Additional Obſervations relating to Feſtuca ſpadicea and Anthoxanthum paniculatum. By James Edward Smith, M. D. F. R. S. and P. L. S.*

Read Feb. 7, 1792.

IN a paper which the Linnean Society have honoured with a place in the 1ſt volume of their Tranſactions, page 111, I have endeavoured to elucidate the botanical hiſtory of the Feſtuca ſpadicea and Anthoxanthum paniculatum of Linnæus, concluding theſe graſſes, from all the means of information then within my reach, to be one and the ſame plant. That no poſſibility of doubt might remain, nor the ſynonyms of this obſcure ſpecies want any certainty that could be procured, I laſt ſummer requeſted Profeſſor Thunberg to compare one of my ſpecimens with that in Burſer's Herbarium at Upſal, which is the only poſitive authority for aſcertaining what Linnæus meant by his Anthoxanthum paniculatum. In a letter dated Dec. 28, 1791, the Profeſſor aſſures me there is no doubt of their perfect identity.

Knowing myſelf to be the ſole author of this elucidation, the progreſs of which is detailed in the paper above mentioned, it is not without ſome ſurpriſe that I read in Profeſſor Vahl's 2d faſciculus of his Symbolæ Botanicæ, page 22, the material parts of my diſcovery given as his own in the following words.

Feſtuca ſpadicea—Linn. S. V. pag. 118. Gouan illuſtr. p. 4.
Anthoxanthum paniculatum—Linn. S. V. p. 73. ſide Herbarii Linnæi.
Poa Gerardi. Allion. Fl. Ped. No. 2201.
Variat calycibus 3-ſive 5-floris.

Now

Now the manner in which this is expreſſed implies that the author had, from the Linnæan Herbarium, learned Feſtuca ſpadicea and Anthoxanthum paniculatum to be the ſame plant; whereas it is ſufficiently manifeſt, from my former paper, he could never have diſcovered from that ſource what either of thoſe plants was; there being nothing in the Herbarium to repreſent the latter, and of the former only an imperfect anonymous ſpecimen, placed at the end of the genus of Feſtuca, which could never have been aſcertained but by the peculiar train of circumſtances which led me to the knowledge of it, and which was certainly never known to be Feſtuca ſpadicea till it was announced as ſuch before this Society, Oct. 5, 1790, that is, about five years after Profeſſor Vahl ſaw the Herbarium; ſtill leſs had any botaniſt in Europe till then ſuppoſed the ſame Feſtuca to be Poa Gerardi of Allioni.

XV. *Plantæ Eboracenſes; or, A Catalogue of the more rare Plants which grow wild in the Neighbourhood of Caſtle Howard, in the North Riding of Yorkſhire, diſpoſed according to the Linnean Syſtem. By Mr. Robert Teeſdale, F. L. S.*

Read Feb. 7, 1792.

DURING the time I reſided at Caſtle Howard, in the county of York, ſome of my leiſure hours were employed in herborizing: my buſineſs not admitting of long excurſions, it enabled me to take the more pains in the collecting of the plants of my own neighbourhood.

The woods about Caſtle Howard are extenſive, and the bogs near Terrington produce many valuable acquiſitions to the curious inveſtigator.

The downs called the Wolds are likewiſe productive of ſome good plants.

I ſeldom extended my rides, or walks, upon thoſe botanical excurſions, more than ten or fifteen miles from home; and upon ſumming up the plants that I had obſerved, and collected, they amounted to nine hundred and ſixty. This I preſume, will be thought a great number to be found, in ſo ſmall a ſpace of country, by one collector; as the learned Dr. Martyn tells us, in his Plantæ Cantabrigienſes, that with the indefatigable labours of Mr. Ray,

Mr. Lyons, himſelf, and doubtleſs many other reſidents of the Univerſity, they have made their catalogue amount to eight hundred and twenty-nine only.

In the following liſt, moſt of the plants which are common in every part of our iſland are omitted, excepting in the Cryptogamia claſs.

Notwithſtanding I have found ſuch a number, I have no doubt but, upon a more nice inveſtigation into the minutiæ, with ſuch accuracy and knowledge as my friend Mr. Dickſon poſſeſſes, many more plants may be diſcovered.

To the more rare ones I have added their *habitats*, by which means the travelling botaniſt may the more readily find the plant he may wiſh to add to his Herbarium.

Monandria Monogynia.

Hippuris vulgaris - - in rivers and rivulets, not very common.

Diandria Monogynia.

Veronica montana - - in woods at Caſtle Howard.
Pinguicula vulgaris - - upon moſt moiſt heaths.
Utricularia vulgaris - } in a peat moſs called Terrington Car.
minor - }
Circæa alpina - - in the woods near Kirkham.

Triandria Monogynia.

Schœnus compreſſus - upon Welburn Moor—but rare.
Mariſcus - in Terrington Car—but rare.
albus - - } in the above Car.
nigricans - }

Scirpus

Scirpus cæſpitoſus - } upon Stockton Common, Terrington Car,
acicularis - - } and many other watery heaths.
ſetaceus - - } and many other watery heaths.
fluitans - - } and many other watery heaths.
ſylvaticus - - near the Abbey at Kirkham, and in Pretty-wood at C. Howard.

Eriophorum vaginatum upon a heath N. Weſt of Terrington.

Digynia.

Milium effuſum - - in woods at Caſtle Howard, but rare.
Agroſtis Spica-venti - in Bulmer corn fields, but is ſcarce.
Aira montana - - in ſtony woods and heaths about Caſtle Howard.
Poa compreſſa - - upon old walls at Caſtle Howard, but not common.
Feſtuca ovina - - upon dry heaths.
vivipara - - upon Hambleton hills, but rare.
Bromus arvenſis - - in Bulmer and Malton corn fields.
pinnatus - - near Nunnington, and other places.
Arundo Calamagroſtis - } in woods at Caſtle Howard, the latter
epigejos - } very rare.
Lolium temulentum - amongſt corn, but is not common.
Hordeum ſylvaticum - in the woods at Caſtle Howard.

Tetrandria Monogynia.

Aſperula cynanchica - upon Langton Wold near Malton.
Galium montanum - upon dry heaths.
uliginoſum - in Terrington Car.
ſpurium - - in Malton corn fields.
boreale - - near Helmſley, but very rare.
Cornus herbacea - - in a place called Hole of Huckham, near Pickering, abundantly; firſt found there by my father.
Alchemilla minor - - in woods at Caſtle Howard.

Tetragynia.

Potamogeiton compreſſum in a rivulet at Hovingham.

puſillum, gramineum } in the fiſh ponds at Caſtle Howard.

Pentandria Monogynia.

Lithoſpermum officinale — in ſtony woods at Caſtle Howard.
Cynogloſſum officinale — near Mowthorpe Dale.
Symphytum officinale — upon the banks of the river Derwent.
Primula farinoſa - - upon heaths near Helmſley.
Menyanthes nymphoides — in the lake of Caſtle Howard abundantly, where I planted it—I believe it is not a native of that neighbourhood.
Atropa Belladonna - in ſtony places at Caſtle Howard, and in the neighbourhood.
Samolus valerandi - - upon Stockton moor, by the ſide of the turnpike road.
Campanula latifolia - in Slingſby lanes.
Trachelium — in Heſlerton woods.
hybrida - in Malton and Bulmer corn fields.

Digynia.

Gentiana Pneumonanthe — in Terrington car, and Stockton common.
campeſtris - upon Terrington common, rare.
amarella - upon the wolds and dry heaths.
Cuſcuta europæa - - this is not common in the north, though ſo abundant in the ſouth of England.
Bupleurum rotundifolium — in the corn fields near Malton and Slingſby.
Tordylium nodoſum - } in Malton fields.
Caucalis leptophylla - }
Heracleum anguſtifolium — in Caſtle Howard woods, but rare.
Siſon inundatum. - - in watery places, not uncommon.

Pen-

Pentagynia.

Linum perenne - - in Bulmer field, at the end of the avenue which leads to Caſtle Howard.
Radiola - - Terrington common.
Droſera rotundifolia - in Terrington car.
longifolia - anglica Hudſ. } with the above, but the laſt ſpecies is rare.

Polygynia.

Myoſurus minimus - in fields ſouth-eaſt of Welburn.

Hexandria Monogynia.

Allium arenarium - - in a meadow called Santines at Caſtle Howard, very ſcarce, and I never found it in any other place.
oleraceum - in plowed fields near Hovingham moor.
Ornithogalum luteum near Stitnam, but rare.

Trigynia.

Triglochin paluſtre - in Terrington car.

Heptandria Monogynia.

Trientalis europæa - - upon the moors near Helmſley.

Octandria Monogynia.

Epilobium anguſtifolium in Bilſdale, above Helmſley.
Vaccinium Oxycoccus in Terrington car.
Daphne Laureola - - in woods—common.

Trigynia.

Polygonum Biſtorta - in moiſt meadows.

Tetragynia.

Adoxa Moſcatellina - in ſhady places near Kirkham.
Paris quadrifolia - - in moſt of the ſhady woods.

Enneandria Hexagynia.

Butomus umbellatus - in the river Derwent, at Howſham.

Decandria Monogynia.

Pyrola rotundifolia - in woods at Helmſley.

Digynia.

Chryſoſplenium oppoſitifolium — in Mowthorpe dale, and in moiſt ſhady lanes and woods.

alternifolium — near Hornby, but is very rare.

Scleranthus annuus - in Bulmer field, but rare.

Dianthus deltoides - about Scampſton.

Trigynia.

Stellaria nemorum - by rivulets, and ſhady moiſt woods.

Arenaria tenuifolia - upon Barton heights, near C. Howard.

Pentagynia.

Spergula nodoſa - - upon moiſt heaths.

Icoſandria Polygynia.

Rubus idæus - - in the woods at Caſtle Howard.

ſaxatilis - - in ſtony woods, but rare.

Potentilla argentea - } in rocky woods, at Caſtle Howard and

verna - } Hovingham.

Geum rivale - - in moſt woods, common.

Comarum paluſtre - in Terrington car.

Polyandria Monogynia.

Actæa ſpicata - - at Hilderſley, and in Hovingham lanes.

Papaver hybridum

Argemone } in Malton corn fields.

dubium

Nymphæa alba - - near Sheriff Hutton, and in the river Foſs.

Hexagynia.

Stratiotes aloides - - I planted this in the lake at Caſtle Howard, where it has increaſed ſo much that one can hardly get a drag net through it.

Polygynia.

Ranunculus Lingua - in Terrington car.
parviflorus in Malton fields.
Trollius europæus. - in Hovingham woods, near Holley-hill.
Helleborus viridis - in the hedges near Stonegrave, but is ſcarce.

Didynamia Gymnoſpermia.

Mentha piperita - by the ſide of a rivulet at Lutton upon the wolds.
Galeopſis tetrahit - amongſt the corn, frequent.
Scutellaria minor. - in Terrington car.

Angioſpermia.

Orobanche major - in Malton field.
Lathræa ſquamaria - in the woods near Kirkham, at the foot of ſome rocks.

Tetradynamia Siliculoſa.

Iberis nudicaulis - - in Bulmer fields.

Siliquoſa.

Turritis glabra - - in the lanes near Thirſk.
Cardamine amara - - by the river Derwent at Kirkham, and in many other places.

Monadelphia Decandria.

Geranium ſanguineum in Malton fields.

Polyandria.

Polyandria.

Malva Alcea - - } in Malton and Bulmer corn fields, by the
moſchata - } hedges.

Diadelphia Decandria.

Lathyrus Aphaca - in Malton fields.
Vicia ſylvatica - - this beautiful vetch grows in Slingſby wood, and Coneyſthorpe banks, near Caſtle Howard.
Ornithopus perpuſillus in ſandy corn fields.
Aſtragalus arenarius, *Hudſ.* upon the wolds near Birdſall, and by the road from Malton to Settrington.

Polyadelphia Polyandria.

Hypericum montanum in woods at Caſtle Howard.
elodes - in Terrington car.

Syngeneſia Polygamia æqualis.

Hieracium paludoſum } in woods at Caſtle Howard.
ſubaudum
umbellatum
Bidens minima - - in Terrington car.

Polygamia ſuperflua.

Gnaphalium dioicum upon Bulmer and Wilburn moors.
ſylvaticum in various places.
Inula Helenium - - in Mowthorpe dale.
Anthemis nobilis - upon Terrington common.

Monogamia.

Viola paluſtris - - in Terrington car, and other bogs.
lutea - - upon the wolds, and I have ſometimes found it with large purple flowers.

Gynan-

Gynandria Diandria.

Orchis bifolia	- -	in woods and meadows at C. Howard.
maſcula	- -	
morio	- -	
latifolia	- -	
maculata	- -	
pyramidalis	-	in dry ſtony meadows, about Caſtle Howard.
uſtulata	- -	
conopſea	- -	
Satyrium viride	- -	in dry meadows and paſtures; the latter is rare.
fuſcum	- -	
albidum	- -	upon the mountains north of Helmſley; rare.
Ophrys Nidus-avis	-	in Coneyſthorpe banks, an extenſive ſhady wood near Caſtle Howard.
ſpiralis	- -	in dry paſtures at Whitwell, but is ſcarce.
ovata	- -	in woods.
cordata	- -	I found this elegant little plant amongſt the heath upon Hornby hills.
muſcifera	-	near Hildenlay ſtone-quarry, but not frequent.
apifera	- -	
Serapias latifolia	-	in Raywood: var. γ. in bogs at the bottom of Prettywood, at C. Howard.
var. β. γ.	-	
longifolia	-	in a wood called Cum Hag at C. Howard, rare.

Monoecia Monandria.

Zannichellia paluſtris	-	in fiſh ponds at Caſtle Howard.
Chara tomentoſa	-	in the new river at Caſtle Howard.
hiſpida	- -	in old marle pits, near Sheriff Hutton.
flexilis	- -	in Terrington car.
vulgaris	- -	in all ponds.

Dian-

Diandria.

Lemna minor - - } in rivers and ponds, the two latter are
trifulca - - } not very common.
polyrrhia - }

Triandria.

Carex dioica - - } upon Stockton moor, and other heaths.
pulicaris - }
brizoides - - } in Terrington car, but very rare.
limofa - - }
paniculata -]
difticha - -]
leporina - -]
vulpina - -]
muricata -]
pilulifera -] upon various heaths, woods, &c. in the
flava - -] neighbourhood of Caftle Howard.
cæfpitofa -]
diftans - -]
faxatilis -]
panicea - -]
palleícens -]
fylvatica -]
acuta - -] in various places, not uncommon.
hirta - -]
veficaria - -]

Tetrandria.

Littorella lacuftris - upon Stockton common, and Terring-
ton car.

Dioecia Triandria.

Empetrum nigrum - upon Earfley moor, and above Helmfley.

Tetran-

Tetrandria.

Viſcum album - - it is very common in the Weſt Riding of Yorkſhire, but is hardly to be met with in the North and Eaſt Ridings.

Cryptogamia Filices.

Equiſetum hyemale - in ſome dry woods at Caſtle Howard, and Kirkham, not common.

Ophiogloſſum vulgatum in ſome meadows at Caſtle Howard, but rare.

Oſmunda lunaria - upon the Mauſoleum-hill, and near the Pyramid at Caſtle Howard.

Acroſtichum Thelypteris in Terrington car; I never met with it in any other place.

Aſplenium Scolopendrium, Trichomanes, Ruta muraria, Adiantum nigrum } common.

Polypodium vulgare -, aculeatum, Filix mas, Filix fœmina, criſtatum } in woods, common.

Phegopteris, Dryopteris } in the ſtone quarry at C. Howard, and in woods at Hornby and Helmſley.

Oreopteris, Dickſ., faſc. in woods at Caſtle Howard and Hornby.

Though the late ingenious Mr. Lightfoot does not take notice of this elegant fern in his Flora Scotica, it was not unknown to him, as ſome letters paſſed betwixt him and me concerning it. At firſt he inſiſted on its being the Acroſtichum Thelypteris; but I con-

vinced him of the contrary. And he afterwards thought it might poſſibly be the Polypodium marginale of Linnæus; but Mr. Dickſon ſays, upon comparing it with that plant in the Linnæan Herbarium, it is found to be very different.

The leaves of this Polypody have a very agreeable ſcent, which I have not obſerved in any other of the Engliſh ferns. Perhaps the Polypodium fragrans of Hudſon may be only a variety of this.

Pilularia globulifera - upon Stockton moor, Terrington car, and other watery heaths.

Muſci.

Lycopodium clavatum upon Earſley moor.

Selago - } in Terrington car, and upon Welburn
Selaginoides } moor.
inundatum }

Sphagnum paluſtre - in all bogs.

alpinum - Terrington common. I never found it in fructification.

arboreum - upon trunks of trees in a wood at Caſtle Howard, called Mount Sion, but very rare.

Phaſcum acaulon - } in the ſandy part of Bulmer field.
fubulatum }

Fontinalis antipyretica in rivers and rivulets.

minor - in rivulets at Hornby and Helmſley.

Splachnum ampullaceum at the eaſt end of Terrington car. I never found it in any other place, and always upon cow's dung.

Polytrichum commune upon heaths and in woods, common.

nanum - upon heaths.

alpinum - on the eaſt ſide of Raywood at Caſtle Howard, near the octagon temple, rare.

Poly-

Polytrichum ſtriatum -
β Dill. muſc. t. 55. f. 9.
γ Dill. 432. t. 55. f. 10.
δ Dill. —— t. 55. f. 11.
} upon trunks of trees, old paling and rocks.

Mnium pellucidum -
androgynum
} in ſhady woods at Caſtle Howard, but not common.

paluſtre - in Terrington car.

trichomanis -
fiſſum - -
} in ſhady woods.

Jungermannia in Terrington car, amongſt the Sphagnum paluſtre; I never ſaw the fructifications.

Bryum apocarpum - upon rocks, trunks of trees, and roofs of houſes.

pomiforme - in Bulmer fields.

fontanum - in Terrington car, and near rivulets and ſprings.

pyriforme - I always found it upon moiſt heaths.

extinctorium - upon walls, rocks, and ſandy banks, but not common.

ſubulatum - in woods and ſhady places.

murale - -
rurale - -
} common.

truncatulum -
viridulum - -
} upon dry ſandy banks.

paludoſum - in Terrington car, and upon ſtones in Raywood; but very rare.

undulatum - in woods, and under hedges.

glaucum - - upon heaths; I never could find this moſs in fructification.

hypnoides - upon Terrington moor.

var. of do. - ſeveral.

Bryum ſcoparium - - in woods and upon heaths.
heteromallum - upon heaths.
tortuoſum - - upon the rocks at Hornby.
virens Dickſ. faſc. upon rocks at Hornby and Helmſley—but rare.

cirratum - - } common in ſandy grounds.
purpureum - }
imberbe - - upon rocks, at Hornby.
unguiculatum - upon ſandy ſoils.
tenue barbatum, foliis anguſtioribus & rarioribus, Dill. t. 48. f. 49. } in ſtony places, at Caſtle Howard.
ſimplex - - } upon the ſides of ditches, on Slingſby moor, and other heaths; but rare.
ſericeum - - }
carneum - - }
hornum - - in woods, common.
annotinum - in Terrington car, and by the ſides of rivulets in other places.
aureum - - upon rocks at Hornby and Helmſley.
argenteum - common.
var. β - - is rare.
hygrometricum } common.
capillare - - }
cæſpiticium - }
pulvinatum - }
ſerpyllifolium - } in ſhady woods.
proliferum - }
undulatum - }
punctatum - in bogs.
cuſpidatum - near ſprings and rivulets.

Hypnum

Hypnum bryoides - -	} in ſhady woods, frequent.
taxifolium -	
denticulatum -	
ſylvaticum -	
pennatum, Dickſ. faſc. t. 1. f. 8.	} upon trunks of trees in Raywood, but very rare.
adiantoides -	in Terrington car, not common.
complanatum	upon trunks of trees.
lucens - -	in ſhady woods near Helmſley, but is rare to be met with.
undulatum -	in Raywood, not common.
criſpum - -	upon rocks at Hornby, but ſeldom in fructification.
triquetrum -	in woods, and under hedges.
rutabulum -	} common.
do. varieties -	
filiforme - -	upon trunks of trees, not common.
filicinum - -	in bogs, and near ſprings.
proliferum -	} common.
prælongum -	
parietinum -	
plumoſum -	upon rocks, and in ſtony places.
Griſta caſtrenſis	upon the drieſt rocks, and likewiſe in bogs.
compreſſum -	} upon trunks of trees, rocks, and in ſtony places.
cupreſſiforme -	
aduncum -	in Terrington car.
ſcorpioides -	in Terrington car; I never found it any where elſe in the neighbourhood: it flowers in March.
viticuloſum -	upon rocks, and trunks of trees, in Mowthorpe dale.

Hypnum

Hypnum ſquarroſum, loreum - - } in woods, hedges, &c. common.
dendroides - in Terrington car, and ſome boggy parts of woods.
alopecurum - in ſhady woods.
curtipendulum upon rocks and trunks of trees.
purum - - upon heaths.
riparium - upon ſtones in rivers and rivulets; this Hypnum varies very much.
cuſpidatum - in bogs and woods.
ſericeum - - } upon trunks of trees, and ſtones.
velutinum - }
ſerpens - - upon ſtones, is readily diſtinguiſhed by the white calyptra's.
ſciuroides - upon rocks and trees, not common.
myoſuroides - upon trunks of trees.
ſtramineum, Dickſ. faſc. 6. t. 1. f. 9. } in Terrington car, amongſt the Sphagnum paluſtre.
paluſtre - - upon ſtones by Crambe-beck Bridge, but rare.
ornithopodioides, Hudſ. gracile, Lightf. - - } upon trunks of trees, rare.
clavellatum - upon ſtones, uncommon.
ſtellatum, Dickſ. faſc. t. 1. f. 7. } in Terrington car.
Dill. t. 39. f. 42. upon rocks and ſtones near Crambe-beck.
Dill. t. 38. f. 33. in Terrington car.

Algæ.

Jungermannia aſplenioides, var. β. Dill. t. 69. f. 6. } in woods at Caſtle Howard.
lanceolata - by the rivulet at Hornby.
bicuſpidata - in woods and ſhady places.
inflata - in Terrington car, and upon moſt heaths.
bidentata - in ſhady woods, and under hedges and walls.
polyanthos - in a wood at Caſtle Howard, called Cum-hag, not common.
anguloſa, Dickſ. faſc. p. 7. Dill. t. 71. f. 22. } in ſome ſhady woods at C. Howard, but rare.
nemoroſa - in the above woods, not common.
reſupinata - in the fiſſures of rocks at Hornby and Helmſley.
reptans - - in bogs and moiſt places, not unfrequent.
albicans - in Raywood, and other woods.
undulata - in bogs, and ſhady woods.
pauciflora, Dickſ. faſc. 2. p. 15. t. 5. f. 9. } at the eaſt end of Terrington car, amongſt the Sphagnum paluſtre.
Sphagni - in the ſame place as the above; I never ſaw it in fructification.
platyphylla } upon trunks of trees, common.
tamariſcifolia
dilatata - - } upon trunks of trees, common.
complanata

Jungermannia

Jungermannia ciliaris - I found this beautiful and rare ſpecies by the rivulet at Hornby, and in a boggy part of Caſtle-Howard park, near the keeper's lodge.

varia - - in Terrington car, and in woods.

epiphylla - in moiſt and ſhady places.

pinguis - - in ſhady woods, bogs, and by the ſides of ditches.

multifida - in the ſame places as the above.

puſilla - - I found this rare and minute Jungermannia in September 1767, in the ſhady gravel walks in Raywood, and never ſaw it any where elſe; it begins to flower in the Autumn, and continues until the end of March.

furcata - - upon rocks and trunks of trees. I have likewiſe gathered ſpecimens which have the habit of this, but are very hoary; I gave ſome to my ingenious friend Mr. Dickſon, who probably may, by and by, give them a minute examination: I could not find any in fructification, though I have examined them very frequently and at different ſeaſons, and the J. furcata is well known to be often met with in flower.

Anthoceros punctatus - amongſt the graſs by the ſide of the lake at Caſtle Howard; but very ſcarce.

Marchantia polymorpha
Do. var. β. - - } in moiſt and ſhady places.

Marchantia

Marchantia conica - - by the ſides of rivers, and ditches.
hemiſphærica in Terrington car, and upon moiſt rocks at Hornby and Helmſley.
Riccia glauca - - in ſhady parts of Raywood.
minima - - with the former, but rare.
fruticuloſa, Dickſ. faſc. p. 8. - } upon the trunks of trees in Raywood. I never met with this beautiful moſs any where elſe.

Lichen ſcriptus - - } upon trunks of trees.
carpineus - -
fagineus - -
ſubfuſcus - -
rugoſus - -
ericetorum - - upon heaths.
lacteus - - upon rocks at Hornby.
calcareus - - upon heaths.
ſphæroides Dickſ. faſc. p. 9. - } upon barren heaths, and rocks.
caneſcens, Dickſ. faſc. p. 9. } upon trunks of trees.
candelarius - upon walls and trees.
tartareus - - upon rocks about Hornby and Helmſley, but rare.
rufus - - upon heaths.
ater - - upon trunks of trees, and old paling.
parellus - - upon heaths and rocks.
palleſcens - - upon trees.
faxatilis - - } upon trunks of trees and rocks.
parietinus - -
olivaceus - -
ſtellaris - -

Lichen granulatus - amongſt rocks, rare.
omphalodes - upon the rocks at Hornby and Helmſley, but rare.
phyſodes - - upon the park pales of Caſtle Howard, but not frequent.
ciliaris - - }
perlatus - - }
pulmonarius - }upon trees, common.
farinaceus - - }
prunaſtri - - }
fraxineus - - }
glaucus - - }upon the park paling at Caſtle How-
furfuraceus - } ard, but rare.
iſlandicus - - upon Terrington, Stockton, and Earſley moors.
hiſpidus, Lightf. with the above.
verrucoſus, Hudſ. }upon trees in Coneyſthorpe banks,
i. e. ſcrobiculatus, Lightf. } a large wood at C. Howard, rare.
Lichenoides hiſpidum minus et tenerius, ſcutellis nigris, *Dill. t.* 20. *f.* 46. - - }upon trees and pales.
calicaris - - upon old paling, but very rare.
tremelloides - amongſt the moſs upon rocks at Hornby, not frequent.
caperatus - - upon trunks of trees, particularly the beech and aſh.
faſciculatus, Lin. upon old gravel walks at Caſtle Howard.
caninus - - }common.
ſylvaticus - - }

Lichen

Lichen horizontalis - in woods, not common.
miniatus - - upon rocks in Mowthorpe dale.
cocciferus - -]
cornucopioides |
pyxidatus - - |
fimbriatus - |
gracilis - - } upon heaths.
digitatus - - |
ventricoſus - |
cornutus - - |
difformis - -]
rangiferinus - } in woods, and upon heaths.
ſylvaticus - - }
globiferus - - upon rocks in Bilſdale, rare.
uncialis - - } upon heaths.
fubulatus - - }
plicatus - - upon trees; I gathered ſpecimens of this in Coneyſthorpe banks, near two feet long.
hirtus - - upon trees.
floridus - - upon trees, but rare.
Tremella Noſtoc - - } common.
Auricula - - }
Ulva cornuta - upon ſtones in rivulets, rare.
Ulva terreſtris tenerrima } in ſhady places.
viridis criſpa, R. Syn. }
Conferva rivularis - - } in rivers, common
canalicularis }
gelatinoſa - upon the ſtones in the rivulet at the bottom of Caſtle-Howard park.

Byſſus incana
lactea
velutina
and many others.

Fungi.

Agaricus chantarellus
integer
muſcarius
lactifluus - } in Raywood.
piperatus - - }
campeſtris - }
viſcidus - - }
clypeatus - } common.
androſaceus - }
quercinus - }
pectinatus - }
Boletus verſicolor - - }
albus - - } common.
igniarius - - }
bovinus - - }
luteus - - - } in Raywood.
Hydnum imbricatum - under the large beeches in Raywood, rare.
Elvela Mitra - - - with the above, rare.
Phallus eſculentus - - generally under aſh trees.
Peziza lentifera - - }
punctata - - }
Acetabulum - } common.
cyathoides - - }
ſcutellata - - }

Clavaria

Clavaria piſtillaris
ophioglosſoides
digitata
hypoxylon
coralloides
muſcoides
Lycoperdon Boviſta
pedunculatum
ſtellatum - - upon ſandy banks near Ganthorpe, but rare.

XVI. *Ob-*

XVI. *Obſervations on the Britiſh Species of Carex.* *By the Rev. Samuel Goodenough, L.L.D. F.R.S. Tr.L.S.*

Read April 3, 1792.

THE plants arranged under the genus of *Carex*, ſeem always to have laboured under ſome degree of obſcurity and difficulty. They were generally ranked, by the older botaniſts, under a very unmeaning name, *Cyperoides*; and having no ſtriking virtues to recommend them, they were ſpoken of in an indiſtinct method, and were in a manner paſſed over as things unworthy of laborious inveſtigation. In the third edition of Ray's Synopſis, *Cyperoides*, including *Cyperus*, anſwers to our genus *Carex*; the thing likened including and referring to itſelf for its original! The general character is, *Caules triquetri in omnibus, & in pleriſque etiam ſemina:* a deſcription very indefinite. *Moriſon* and *Scheuchzer*, to whoſe conſummate accuracy his Agroſtographia will be a *monumentum ære perennius*, obſerve, with reſpect to our genus of *Carex*, nearly the ſame method as *Ray*. I ſay nothing of the more ancient writers, eſpecially *Gerard* and *Parkinſon*; for their works, being in Engliſh, are not ſo univerſally known. All theſe authors purſued in fact nearly the ſame plan; and thus ſome ſpecies of *Scirpus*, *Schœnus* and *Cyperus*, and all the ſpecies of *Carex* (ſo vague was their generic character) were compriſed under one name, *Cyperoides*, and formed one jarring family.

In

In the beginning of the 18th century, *Ruppius*, *Monti*, *Juſſieu*, and *Michelius*, divided the *Carices* of *Linnæus* into two families. *Michelius*, who deſerves moſt conſideration, divides them into *Cyperoides* and *Carex*. Under the former diviſion he claſſes the Linnean ſpecies which have *ſpicas ſexu diſtinctas*, and under the latter thoſe which have *ſpicas androgynas*: but, in doing this, he ranks *Carex dioica* under the former. I ſhall have occaſion preſently to ſpeak of this diviſion more particularly.

Tournefort, intent upon the corolla, gave a deciſive character taken from that intereſting feature. He ſpeaks however only of twenty-three ſpecies, of which almoſt all are of the order *Sexu diſtinctæ*. But even in this arrangement he offends againſt his own generic character: for he deſcribes his genus (which he ſtyles *Cyperoides*) as having its terminal ſpike barren, and the inferior ones fertile; a deſcription by no means according with the androgynous ſpecies.

Linnæus thought it needleſs to extend his generic character to any farther degree of minuteneſs than what the nature of the flowers called for. The ſituation of the flowers was diſregarded by him: it was ſufficient for his purpoſe that the preſence of male and female flowers determined their place in the claſs *Monœcia* of his ſyſtem, and the parts of fructification determined the genus *Carex*.

Whether *Linnæus*'s generic character be ſufficiently exact, and whether, from the multitude of modern diſcoveries, it may not be adviſable to reſtore the old diviſion into two families, may poſſibly admit of ſome doubt. *Linnæus* deſcribes the Nectarium (by which he means the capſule or tunica enveloping the ſeed, for he alludes indifferently to all theſe three terms) as *inflatum tridentatum*, and the ſtigma as trifid. Suppoſing *tridentatum* to be an error of the preſs for *bidentatum*, ſtill even then a large portion of the family will not

not accord with either of theſe characters. Perhaps the fault lies in including thoſe with androgynous ſpikes, and thoſe whoſe ſpikes are diſtinct in point of ſex, in one family. But this carries me back to *Michelius*, one of the firſt who made a ſeparation between them.

It is true that *Michelius*, by dividing and ſubdividing his families into ſo many orders, rather obſcured the ſubject by his laborious particularity. But ſtill his primary diviſion into two families merits ſome conſideration; for it ſeems a natural one. For, independent of the ſituation of the different flowers, all the androgynous ſpecies, except C. *pauciflora*, have their ſtigma bifid; and the reſt, except three or four, trifid. Perhaps *Linnæus*, though aware of this circumſtance, had not carefully attended to it in forming his generic character. Be that as it will, this conſtant difference of the principal part of fructification, together with their outward habit (certainly very diſcordant), might have warranted their being retained as diſtinct genera; for the moſt ingenious artificial ſyſtem appears to moſt advantage when moſt conſonant with nature. What affinity is there in appearance between *C. dioica* and *riparia*, *C. vulpina* and *capillaris?* Nothing can be more diſſimilar in habit, in nature, and œconomy. We all allow how impolitic it is to multiply genera without a ſufficient cauſe. Equally impolitic is it to overload any genus with numerous ſpecies, which would naturally divide themſelves into diſtinct families. Perſpicuity is the end of ſyſtem; and that is beſt attained by avoiding each extreme. I have not, however, ventured to ſeparate them into two families. The Britiſh ſpecies, though numerous, do not abſolutely require it: but I can eaſily conceive, that when all the known ſpecies of the world are brought together, ſome ſuch diviſion will contribute very much to the neatneſs of the ſyſtem, and eaſe of the ſtudent. I throw out theſe hints, not preſuming to direct, but wiſhing rather to excite

and

and collect the thoughts of ſuch as may be willing to turn their minds to this ſubject.

But however it is not ſo much to my preſent purpoſe, to enter very minutely into the generic character; that is a point to be reſerved for future conſideration: I am rather anxious to define the ſpecies of this family. When I firſt began to ſtudy them, I met with more difficulties than I had reaſon to apprehend. In the adoption of ſynonyms, *Linnæus* himſelf has made ſome blunders of conſequence: Mr. *Hudſon*'s C. *ſpicata*, is the C. *muricata* of *Linnæus*—but *Linnæus*, in quoting his ſynonyms, ſelects ſome expreſſive of Mr. *Hudſon's ſpicata*, and others of his *muricata:* ſo alſo, thinking them to be the ſame, he quotes *Moriſon*'s figure of *recurva* to his *cæſpitoſa*. I could mention more inſtances of the ſame kind.

Again, there has always prevailed an idea of the many varieties of the ſeveral ſpecies; a ſuppoſition by no means well founded.—Thus *Linnæus* makes *ſylvatica*, *veſicaria* and *ampullacea* varieties of each other. Thus alſo, *riparia*, *paludoſa*, and *acuta*, have moſt unaccountably, by many authors, been looked upon as partakers of the ſame origin. The accurate Mr. *Curtis* firſt noted their reſpective limits.

As *Linnæus*, not always having the whole plant before him, could not form any diſcriminating character from the root, ſo few of his followers have done it; whereas, in many of the ſpecies, it is of importance to know the root. Thus, when we know that *dioica* has a creeping root, and *pulicaris* a fibrous one, we are at once enabled to diſtinguiſh them in any ſtage of growth: their ſpikes at their firſt formation are often ſimilar.

But the greateſt perplexity to be met with ariſes from the Linnean diviſion into ſpikes ſeſſile and pedunculated: cultivation, or, in a natural ſtate, a caſual luxuriant growth, does away the whole diſtinction. Thus *C. diſtans* always has its ſpikes on long footſtalks;

but theſe being embraced by the petiolus or vagina of the foliaceous bracteæ, gave occaſion to *Linnæus* to ſtyle them ſubſeſſile. But the leaſt injury to the vagina would diſcover the footſtalk, and perplex the young ſtudent beyond deſcription. This latter difficulty principally induced me to have recourſe to a new mark of diſcrimination, which appeared to be leſs liable to variety than moſt others: I mean the proportion which the petiolus or vagina of the foliaceous bractea, in the orders *ſpicis ſexu diſtinctis*, bears to the footſtalk on which the ſpike is ſupported. This mark will always hold out ſomething worthy of obſervation; for if the footſtalk be unuſually long or ſhort, in conſequence of the luxuriance or barrenneſs of the ſoil, the vagina will be found to be affected ſomewhat in the ſame proportion.

In general, the proportion between the parts in the animal and vegetable kingdoms is leſs liable to variation than moſt other circumſtances. Obſerving, therefore, how conſtant the length of the vagina was to that of the footſtalk, I determined to take my leading character from it. Having begun to do ſo in ſome inſtances, I at length became compelled to adopt it in all; *idem enim in omnibus notandum eſt.* And I beg leave to offer this principally as my apology for conſtructing new deſcriptions throughout. Spikes being ſaid to be ſeſſile which were not ſo, called neceſſarily for new deſcriptions: this led on to a change in the deſcription of their affinities, and thence onward, ſo that there was no ſtopping.

It is not to be expected, neither is it neceſſary, or indeed poſſible, in the ſhort ſpace of a ſpecific deſcription, to comprehend all the niceties of diſcrimination which a more leiſure ſurvey will point out; and yet many of theſe muſt ſtrike every obſerver, and muſt be very ſerviceable to him in the purſuit of his enquiries. I will beg leave to ſuggeſt a few of them. Although ſome *Carices* are ſaid to have one male ſpike only, and others more than one, yet ſome of

the

the former order will be found moſt frequently to have two, as is the caſe particularly with *ſtricta* and *filiformis*.

The ſhape of the ſpikes is worth attending to. Obſerving *C. pilulifera* with round female ſpikes, we in moſt ſtages of growth can ſeparate it from *C. præcox*: ſhould any doubt be ſtill entertained, as may happen in their infancy, the thin male ſpike of *pilulifera* will make an appearance quite different from the obovate or rather club-ſhaped one of *præcox*. The filiform ſlender female ſpikes of *C. acuta* make us wonder how it ever could be claſſed with the corpulency of *C. riparia*.

The ſhape of the glumæ, or, as they are often called, ſquamæ, affords, in many inſtances, a very characteriſtic mark, in none more ſo than in *C. rigida*.

The penduloſity of the ſpikes is alſo an intereſting circumſtance. However, in the judging of this circumſtance, the ſtate of the fructification muſt be conſidered: for many whoſe ſpikes are deſcribed to be pendulous, betray that circumſtance only in the advanced ſtate of fructification, as *C. recurva*: ſome only in the early and not in the riper age, as is frequently the caſe with *C. acuta*.

As *Linnæus* founded his ſyſtem upon the parts of fructification, it may ſeem ſtrange that he was not more particular in noting the variation of the number of the ſtigmata. Perhaps his deſcribing from dried and imperfect ſpecimens occaſionally prevented him from examining into this circumſtance. Thus, *C. rigida* is readily diſcriminated from *præcox* by its having only two ſtigmata. The digynous appearance in the flowers of *acuta*, is its primary mark of ſeparation from *C. paludoſa*. I muſt obſerve, when *Linnæus* deſcribed his *cæſpitoſa* in the *Fl. Suecica*, he referred to a plant in *Scheuchzer*, which had three ſtigmata. He excluded this ſynonym afterwards in his ſecond edition of *Sp. Plant.*

In all plants the fruit is a leading circumſtance. The capſule,

or, as it is often called, but I doubt whether with propriety, the nectarium, muſt be often called in to aid the deſcription of *Carices*. The capſule is oblong, as in *palleſcens*; round, as in *piluliſera*; roſtrated, as in *Pſeudo-Cyperus*; ſmooth, as in *panicea*; downy, as in *præcox*; villous, as in *filiformis* and *hirta*; divided at the ſummit, as in *muricata*; entire, as in *ſtellulata*.

In a few ſpecies the foliaceous bracteæ have little auricles at each ſide of their baſe, as is particularly obſervable in *ſtricta*, *cæſpitoſa*, *rigida*, and *acuta*. The length of the foliaceous bracteæ is inconſtant, and therefore muſt be admitted into deſcriptions with extreme caution. *C. arenaria* of Linnæus, and *C. diviſa* of Mr. Hudſon, are deſcribed by *ſpicis foliolo longiori inſtructis*; whereas nothing is more common than to find them with exceedingly ſhort bracteæ, and ſometimes with none at all.

But above all modes whereby the diſtinction of plants is beſt diſcovered, cultivation and attention to the progreſs of their growth is the moſt uſeful. Beyond almoſt all other plants, our patience is required in the inveſtigation of the graſſes. When *Carices* are found in unnatural ſituations, it is impoſſible almoſt to be aware of the appearances which they will put on. On the high ground above Virginia water, I found *C. ovalis* with one male oblong ſpike, neither could I learn its name till I had cultivated it. *C. præcox*, on Hanwell heath, appeared with only one terminal female ſpike. Theſe are irregularities which cultivation alone can detect. A good botaniſt will not be ſatisfied till he can aſcertain his plants in all their ſtages. It is not leſs uſeful than ſatisfactory to know the graſſes, even independent of their flowers: *C. limoſa* not unfrequently produces no flowers; in this ſtate, it has the ſingular property of throwing out long, branching, trailing ſhoots, which may be made to produce new plants by layers, or even by cuttings. Many more niceties of the ſame kind might be mentioned, but I forbear leſt I ſhould ſeem tedious.

Of

Of the uſes of this tribe of plants all authors almoſt are ſilent. The older botaniſts declare themſelves ignorant of any good to be derived from them: perhaps they looked only to the fattening of their cattle; but here it muſt be allowed,

Nec bos pingueſcat malè carice paſtus acutâ.

Linnæus, in his *Fl. Lappon.* adds an entertaining note to his deſcription of *C. ſylvatica*, wherein he tells us, that the Laplanders comb and dreſs this graſs, as we do flax: when it is thus made ſoft, they ſtuff their gloves and ſhoes with it, to defend them from the piercing cold of their ſevere winters: ſo effectually are they ſecured by this covering, that chilblains are not known amongſt them. In ſummer alſo the uſe of the ſame material is retained. The Laplander, unuſed to every ſpecies of luxury, having his ſhoes made of ſkins, not leather, is defended by this means from the bruiſes which he would receive in his travels, as he tends his flocks; and moreover, eſcapes the inconvenience of the heat—*ſudorem enim pedum arcet.* It is not this graſs only, but a variety of graſſes are worked up in this manner. *Linnæus* however obſerved that they were chiefly *Carices*, and of the *Carices* chiefly the *C. ſylvatica.*

Mr. *Lightfoot*, ſpeaking of *C. riparia*, which he calls *acuta*, obſerves, that "in Italy its leaves are uſed by the glaſs-makers to bind their wine flaſks, by the chair-makers to bottom chairs, and by the coopers to place between the junctures of the timber in the heads of their caſks, in the ſame manner as the leaves of the *Typha* are uſed in the ſame country, and the ſtalks of the *Scirpus lacuſtris* in England." *Fl. Scot.* p. 566.

The young foliage and the flower-ſtalks of thoſe *Carices* which grow on heaths, and where there is an abundance of cattle, are obſerved to be eaten off; of courſe they are not wholly without uſe. All *Carices* affect a very moiſt ſituation, and of courſe, in all pro-

probability, will yield an early foliage, and in times of drought a ſure one. There may be countries where this circumſtance may be worthy of conſideration: the large coarſer ſorts might be worked up in all countries, with other materials, for thatching, and for the coarſer purpoſes of covering and protecting againſt weather. All thoſe *Carices* which have creeping roots, are admirably well qualified to give ſtability and firmneſs to the ſurface of quaking bogs. Many of this ſort alſo grow by the ſides of ditches and rivers, and occaſion a tenacity in the banks, ſo that they can reſiſt the violence of currents. Cattle are not fond of theſe; perhaps fortunately ſo, that man may more ſurely, as *Linnæus* has remarked, receive benefit from their growth in places of this nature.

I do myſelf the honour of laying theſe obſervations before the Linnean Society, anxious to facilitate the knowledge of this difficult genus; hoping at the ſame time that others will improve upon them, and at length conſtruct characters more diſtinctive than mine. They are the obſervations of ſolitary walks, and of hours which, through the prevalence of modern faſhion, ſeem as it were privileged to be ſpent in nothingneſs. But the contemplative philoſopher, even in theſe, finds the moſt ſolid delight in dwelling upon the works of the Almighty; and while he views "the things that are made," he confirms himſelf (and it is the true end of the ſtudy of nature) in the belief "of his eternal power and godhead," and of the revelation (for it is a natural deduction) which he hath given of his will.

Obſervation 1. Having, for brevity's ſake, introduced a new term—*Vagina*—into many of my deſcriptions, I beg to define it thus:

Vagina eſt baſis folii vaginantis.

The

The culm of moſt graſſes has what *Linnæus* terms *folia vaginantia*. Some authors have called leaves of this ſort petiolated leaves, but I think improperly: they are better defined *ſheathing leaves*, for they embrace or incloſe the ſtalk at their baſe. This ſheath or vagina in the *Carices* uſually bears a regular proportion to the length of the foot-ſtalks of the ſpikes: I call it, either *æquans*, when of the ſame length as the foot-ſtalk; *dimidiata*, when half of the length; *abbreviata*, when of a quarter of the length.

Obſ. 2. I have purpoſely omitted mentioning the ſeed, not having as yet been able to examine it in a freſh ſtate, in all the ſpecies.

Obſ. 3. Where a plant is ſaid to have vaginæ, the ſpikes are neceſſarily on foot-ſtalks (for the application of that term is to the floral leaf embracing the whole or part of the foot-ſtalk or peduncle); and therefore no mention of that circumſtance is neceſſary in the ſeveral ſpecific deſcriptions.

SYNOPSIS SPECIERUM.

Spicâ unicâ ſimplici.

1. C. *dioica.* Spicâ ſimplici dioicâ, capſularum marginibus ſerrulatis.
2. C. *pulicaris.* Spicâ ſimplici androgynâ ſupernè maſculâ, capſulis divaricatis retroflexis utrinque acuminatis.
3. C. *pauciflora.* Spicâ ſimplici androgynâ, floribus fœmineis ſubternis remotiuſculis patentibus; maſculo ſub-unico terminali.

* *Spicâ compoſitâ androgynâ.*

4. C. *ſtellulata.* Spiculis ſubternis remotis, capſulis divergentibus acutis: ore indiviſo.

5. C. *curta.*

5. C. *curta.* Spiculis ſubſenis ovatis remotiuſculis nudis, ſquamis ovatis acutiuſculis capſulâ brevioribus.
6. C. *ovalis.* Spiculis ſubſenis ovalibus approximatis alternis, ſquamis lanceolatis acutis capſulam æquantibus.
7. C. *remota.* Spiculis axillaribus ſolitariis remotis ſubſeſſilibus, foliolis longiſſimis, capſulis apice indiviſis.
8. C. *axillaris.* Spiculis axillaribus ſubternatis remotis ſeſſilibus, foliolis longis, capſulis apice diviſis.
9. C. *incurva.* Spicâ conicâ ſpiculis plurimis congeſtis ſeſſilibus compoſitâ, involucro nullo, culmo incurvo.
10. C. *arenaria.* Spicâ folioſâ oblongâ acutiuſculâ; ſpiculis plurimis: terminalibus maſculis: inferioribus fœmineis, culmo incurvo.
11. C. *intermedia.* Spicâ oblongâ obtuſâ; ſpiculis plurimis: infimis terminalibuſque: fœmineis intermediis maſculis, culmo erecto.
12. C. *diviſa.* Spicâ ovatâ ſub-decompoſitâ, foliolo erecto inſtructâ, ſpiculis ſubconfertis, capſulis adpreſſis, radice repenti.
13. C. *muricata.* Spicâ oblongâ ſub-decompoſitâ, ſpiculis diſtinctis, capſulis divergentibus: ore diviſo, radice fibroſâ.
14. C. *divulſa.* Spicâ elongatâ decompoſitâ baſi ſub-ramosâ; ſpiculis inferioribus remotis: ſummis contiguis, capſulis ſuberectis.
15. C. *vulpina.* Spicâ ſupradecompoſitâ coarctato-ramosâ obtusâ; ſpiculis ſupernè maſculis, capſulis divergentibus, culmi angulis acutiſſimis.
16. C. *teretiuſcula.* Spicâ ſupradecompoſitâ coarctato-ramosâ acutiuſculâ; ſpiculis ſupernè maſculis, capſulis patentibus, culmo teretiuſculo.
17. C. *paniculata.* Spicâ ſupradecompoſitâ paniculato-ramosâ acutâ: ramis alternis remotiuſculis, capſulis patentibus, culmo triquetro.

* *C. atrata.*

** *Spicis*

** *Spicis ſexu diſtinctis: maſculâ unicâ: bracteis membranaceis.*

18. C. *digitata.* Bracteis membranaceis ſubaphyllis vaginantibus dimidiatis, ſpicis linearibus erectis; maſculâ breviori, capſulis diſtantibus.

19. C. *clandeſtina.* Bracteis membranaceis ſubaphyllis vaginantibus, ſpicis fœmineis oblongis remotis vaginam vix exſuperantibus.

*** ——————: ——————: *bracteis foliaceis, & plerumque vaginantibus.*

20. C. *pendula.* Vaginis longis ſubæquantibus, ſpicis cylindricis longiſſimis pendulis, capſulis ovatis acutis.

21. C. *ſtrigoſa.* Vaginis longis ſubæquantibus, ſpicis filiformibus laxis pendulis, capſulis oblongis ſubtriquetris acutis.

22. C. *præcox.* Vaginis brevibus ſubæquantibus, ſpicis approximatis; maſculâ ſub-clavatâ; fœmineis ovatis, capſulis ſubrotundis pubeſcentibus.

23. C. *filiformis.* Vaginis brevibus ſubæquantibus, ſpicis maſculis ſub-duabus linearibus; fœmineis ovatis remotis, capſulis hirtis.

24. C. *flava.* Vaginis brevibus ſubæquantibus foliolo divaricato, ſpicâ maſculâ lineari; fœmineis ſubrotundis, capſulis roſtrato-acuminatis.

25. C. *extenſa.* Vaginis breviſſimis æquantibus foliolo ſub-reflexo, ſpicis confertis; fœmineis ſubrotundis, capſulis ovatis acutis.

26. C. *fulva.* Vaginâ infimâ ſubdimidiatâ; ſuperioribus ſubæquantibus, ſpicis fœmineis duabus oblongis acutis, capſulis roſtrato-acuminatis.

27. C. *diſtans.* Vaginâ infimâ ferè dimidiatâ; ſuperioribus ſubæquantibus, ſpicis oblongis remotiſſimis, capſulis acutis.

28. C. *panicea.* Vaginâ infimâ ſub-dimidiatâ; ſuperioribus ſub-æquantibus, ſpicis linearibus remotis, capſulis inflatis ſub-diſtantibus obtuſiuſculis.
29. C. *capillaris.* Vaginis dimidiatis, ſpicis fœmineis oblongis laxis; fructiferis pendulis, pedunculis capillaribus, capſulis acuminatis.
30. C. *depauperata.* Vaginis pluſquam dimidiatis, ſpicis fœmineis remotis paucifloris, capſulis inflatis ovatis roſtrato-acuminatis.
31. C. *ſylvatica.* Vaginis abbreviatis, ſpicis filiformibus laxis pendulis, capſulis ovatis ariſtato-roſtratis.
32. C. *recurva.* Vaginis abbreviatis, ſpicis fœmineis ſub-cylindricis pendulis, capſulis rotundato-ovatis, radice repenti.
33. C. *palleſcens.* Vaginis abbreviatiſſimis, ſpicis fœmineis ſub-cylindricis; fructiferis pendulis, capſulis ſubtriquetris oblongis obtuſis.
34. C. *limoſa.* Vaginis abbreviatiſſimis ſub-nullis, ſpicis fœmineis ovatis pendulis, capſulis ovatis compreſſis, radice repenti.
35. C. *Pſeudocyperus.* Vaginis ſub-nullis, ſpicis fœmineis cylindricis pedunculatis pendulis, capſulis nervoſis oblongis ariſtato-roſtratis ſub-divaricatis.
36. C. *atrata.* Vaginis ſub-nullis, ſpicis omnibus androgynis, pedunculatis: fructiferis pendulis, capſulis ovatis acutiuſculis.
37. C. *piluliſera.* Vaginis nullis, ſpicâ maſculâ ſub-lineari; fœmineis confertis ſubrotundis ſeſſilibus, culmo debili.
38. C. *rigida.* Digyna, vaginis nullis, ſpicis oblongis ſubſeſſilibus, foliis ſub-recurvis rigidis.
39. C. *cæſpitoſa.* Digyna, vaginis nullis, ſpicis ſubſeſſilibus ſub-cylindricis obtuſis, foliis erectis molliuſculis.
40. C. *ſtricta.* Digyna, vaginis nullis, ſpicis ſubſeſſilibus cylindricis acutis; maſculis ſub-duabus, foliis erectis ſtrictis.

**** *Spicis*

**** *Spicis ſexu diſtinctis, maſculis pluribus.*

41. C. *riparia.* Spicis oblongis acutis; maſcularum ſquamis lanceolatis: fœminearum ariſtato-acuminatis, capſulis ovato-lanceolatis apice furcato-dentatis.
42. C. *paludoſa.* Spicis oblongis ſub-obtuſis; maſcularum ſquamis obtuſis: fœminearum lanceolatis, capſulis ovato-lanceolatis apice ſub-dentatis.
43. C. *acuta.* Digyna, ſpicis filiformibus; fœmineis infloreſcentibus nutantibus: fructiferis erectis, capſulis acutiuſculis apice indiviſis.
44. C. *veſicaria.* Spicis maſculis linearibus; fœmineis oblongis patentibus, capſulis inflatis oblongis roſtrato-acuminatis patentibus.
45. C. *ampullacea.* Spicis filiformibus; maſculis tenuioribus; fœmineis teretibus erectis, capſulis inflatis globoſis ariſtato-roſtratis divaricatis.
46. C. *hirta.* Piloſa, ſpicis omnibus oblongis; fœmineis remotis vaginatis: vaginis hinc lanato-villoſis, capſulis hirtis.

* C. *filiformis, ſtricta, recurva; & quædam aliæ, quæ aliquando ſpicis maſculis duabus, ſed rariùs ſunt notabiles.*

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1. CAREX DIOICA.

C. Spicâ ſimplici dioicâ, capſularum marginibus ſerrulatis. *Buddle Hort. Sic.* p. 32. n. 5.

Gramen cyperoides minimum ſpicâ ſimplici caſſâ. *Hiſt. Ox.* III. 244. ſ. 8. t. 12. f. 22. *mas.*

Gramen cyperoides minimum ranunculi capitulo rotundo. *Hiſt. Ox.* III. 245. ſ. 8. t. 12. f. 36. *fœmina.*

Cyperoides parvum, n. 1 & 2. *Mich. Gen.* p. 56. t. 32. f. 1 & 2. *Scheuchzer*, 497. t. 11. f. 9 & 10.
Fl. Suecica, n. 833. *Fl. Angl.* p. 401. *Fl. Dan.* 369. *mas & fœmina.* *Fl. Scot.* 541. *Withering*, p. 1026.

Habitat in paluſtribus ſpongioſis. Junio.

DES. *Radix* repens, perennis. *Folia* ſetacea, ſub-triquetra, intus canaliculata, erecta, culmum floriferum ſub-æquantia, glabra. *Culmus* tenuis, erectus, triqueter, angulis acutiuſculis, glaber, 4—10 uncialis, foliis demum paulò longior. *Spica* maſcula oblonga, bracteâ brevi ovatâ fuſcâ in mucronem deſinenti, ½—1 uncialis; ſquamis oblongis acutiuſculis fulvis, nervo dorſali obſoletiuſculo viridi. Filamenta tria; antheræ lineares flavæ. *Spica* fœminea oblonga demum ſubcylindrica, ſquamis ut in maſculâ, capſulâ brevioribus. *Capſulæ* ſæpius ſub-diſtichæ, patentes, ovatæ, acutæ, marginibus apicem verſus minutiſſimè ſerrulatis, ore integro. Stigmata duo.

So great a ſimilarity prevails between what are called C. *dioica* and *capitata*, that no author has as yet ſtruck out a conſtant ſatisfactory difference of character. Mr. *Hudſon*'s introduction of *Linnæus*'s C. *capitata* into the catalogue of Britiſh plants, has excited an enquiry into the reality of that ſpecies, and in particular with reſpect to its being a native of Britain. Indeed the difference between them at moſt ſeems very trifling. In C. *capitata* the ſpike is round, and ſomewhat (owing to the male flowers at the top) conic: in the female C. *dioica*, it is ovato-oblong. The capſules ſeem broader in *capitata*. In *dioica* the capſules are moſt minutely ſerrated towards the point; in *capitata* they are entire. In *dioica* the capſules are ſtriated with nerves, which can ſcarcely be ſaid to appear in the very few ſpecimens of *capitata* which I have ſeen. I have found the male *dioica* with a female

flower

flower or two at the baſe of the ſpike, the capſules of which very much reſemble thoſe of the Swediſh *capitata*. In *Uvedale's Herbarium Rayanum*, vol. 12. fol. 68. n. 5. and in Mr. *Lightfoot*'s herbarium, to which I had acceſs, through her MAJESTY's moſt gracious condeſcenſion, who is now the poſſeſſor of it, are ſpecimens of the female *dioica*, with ſeveral male flowers at the top of the ſpike. The leaves in both ſpecies are exactly the ſame; the ſtyle in each has two ſtigmata. I have ſeen capſules in *dioica* where there is no viſible ſerrulation on the edges. Swediſh ſpecimens of *capitata* are in the rich herbaria of Sir *Joſeph Banks* and Dr. *Smith*. All my ideas of the plant are taken entirely from them.

The ſynonyms of *Ray* and *Moriſon*, which *Linnæus* quotes for *capitata*, are undoubtedly to be referred to C. *dioica*. He himſelf referred them to it in *Fl. Suecica*. In the places ſo particularly mentioned by thoſe authors, C. *dioica* and that only has ever been found.

The different figures of *Michelius* have led into ſome error.—I do not heſitate to ſay, that the female figure No. 1. is careleſsly drawn: its being repreſented with three ſtigmata, inſtead of two which it ought to have (as is evident from a ſpecimen in Mr. *Lightfoot*'s herbarium), is a ſufficient proof of it. This is that Iriſh variety mentioned by *Ray*, in his *Synopſis*, p. 425, n. 66. In *Michelius*'s figure, n. 2. no male flowers are to be ſeen at the ſummit: neither are they in *Moriſon*'s figure, n. 36. Theſe figures are both very decent repreſentations of the female dioica: they bear no ſimilarity to the ſpecimens of *capitata* mentioned before.

Scheuchzer's figure ſeems like *pulicaris*, rather than *dioica*. It is poſſible he may have confounded the two together, as any one might do in their infant ſtate.

Upon the whole, therefore, I can ſee no reaſon why C. *capitata* ſhould be continued as a Britiſh ſpecies, and therefore have excluded it.

I do

I do not pretend to be the *firſt* diſcoverer of the difference of the capſule in *capitata* and *dioica*, as mentioned above.—Dr. *Smith*, long before I had the happineſs of his acquaintance, had, unknown to me, communicated it to ſome of his friends. As his herbarium muſt be conſidered as the fountain-head of all botanical authority, I was particularly happy in the coincidence of his opinion, and, in deference to it, added to the ſpecific deſcription of C. *dioica*, *capſularum marginibus ſerrulatis*.

2. CAREX PULICARIS.

Spicâ ſimplici androgynâ ſupernè maſculâ, capſulis divaricatis retroflexis utrinque acuminatis. *Uvedale, Herb. Rayan.* vol. 12. p. 68. n. 3.

Carex minima. *Mich. Gen.* 66. t. 33. f. 1.

Gramen cyperoides minimum, &c. *Moriſ. Hiſt. Ox.* III. p. 244. ſ. 8. t. 12. f. 1. *Pluk. ph.* t. 24. f. 10.

Fl. Lappon. n. 339. *Leers*, 198. t. 14. f. 1. *Fl. Ang.* 402. *Fl. Scot.* 543. *Fl. Dan.* 166.

Habitat in paludibus turfoſis & limoſis. Junio.

Radix fibroſa, perennis. *Folia* ſetacea, ſaturaté virentia, rigida, glabra, erecta, culmo breviora canaliculata, hinc convexiuſcula & nervoſo-angulata. *Culmus* erectus teretiuſculus glaber 3-12 uncialis. *Spica* ſimplex, cylindracea, terminalis. Flores maſculi plurimi ſuperiores, fœminei circiter totidem inferiores laxè imbricati. Squamæ ſubfuſcæ, ovatæ, acutæ, capſulâ breviores, nervo dorſali viridi, deciduæ. *Capſulæ* ovatæ utrinque acuminatæ, trigonæ, glaberrimæ, mox divaricatæ, demum pendulæ ore integro. Filamenta tria; antheræ lineares flavæ. *Stigmata* duo.

Obſ. Squamæ florum maſc. obtuſiores quam fœmin.

This plant is ſo very diſtinct in itſelf, and is ſo well diſtinguiſhed by

by all authors, that there is no neceſſity of adding to the general maſs of deſcription.

He who would wiſh to peruſe good deſcriptions of it, would do well to conſult Mr. *Lightfoot's Flora Scotica*, and Mr. *Leers's Flora Herbornenſis*—a book which ought to be in the hands of every botaniſt who wiſhes to enter into a practical ſtudy of his ſubject.

The figure in *Moriſon* is extremely characteriſtic.—*Leers* gives the plant in both a young and mature ſtate, together with all the parts of fructification.—*Michelius*'s figures in general are to be depended upon—but he is not faultleſs in his adapting of ſynonyms: he quotes *Mor.* figure 22, which is the male dioica, to this plant.

3. CAREX PAUCIFLORA.

C. ſpicâ ſimplici androgynâ, floribus fœmineis ſubternis remotiuſculis patentibus; maſculo ſub-unico terminali. *Lightfoot, Fl. Scot.* 543. tab. vi. f. 2.

C. patula. *Hudſ. Fl. Ang.* 402. *Withering*, p. 1027.

Habitat in ericetis montoſis.

I have never had an opportunity of cultivating this ſpecies, or of ſeeing it alive, or even in a freſh ſtate.

Mr. *Hudſon* and Mr. *Lightfoot* have both deſcribed this plant. Their deſcriptions, although they differ in their mention of the number of the flowers, yet agree very well in ſetting forth the general habit of the plant, and the ſituation of the male and female flowers.

Mr. *Lightfoot* has given an excellent figure. As his publication was prior to Mr. *Hudſon*'s, and as his name is more expreſſive (and that is no ſlight object), I am an advocate for reſtoring the name *pauciflora*.

I take

I take the following deſcription from ſpecimens in Sir *Joſeph Banks*'s herbarium, tranſmitted by Mr. *Lightfoot*. Mr. *Lightfoot* favoured me alſo with ſeveral ſpecimens, which entirely accord with Sir *Joſeph's*.

Radix ——

Folia erecta, glabra, triquetra, culmo breviora.

Culmus 3-5 uncialis, præterquam ad baſin nudus, triqueter, glaber.

Spica androgyna, ſimplex, laxa, floribus circitèr quinque, quorum ultimus maſculus. Squamæ elongatæ, lanceolatæ, acutæ, longitudine capſularum.

Capſulæ ——

Styli tres. An hoc ſemper?

4. CAREX STELLULATA.

C. ſpiculis ſub-ternis remotis, capſulis divergentibus acutis, ore integro. *Buddle Hort. Sic.* p. 32. *Uvedale Herb. Ray.* vol. 12. p. 68. n. 1.

Carex ſpicis ternis echinatis, glumis lanceolatis, capſulæ mucrone ſimplici. *Haller Hiſt.* 1366.—*Raii Synopſ.* 424. n. 12.

Gramen cyperoides echinatum minimum. *Park.* 1272. *Moriſ. Hiſt. Ox.* III. 344. ſ. 8. t. 12. f. 26.—*Leers*, t. 14. f. 8. *opt.*—*Scheuchzer* 485. t. 11. f. 3.

Carex muricata. *Hudſ. Fl. Angl.* 406. *Fl. Scot.* 549. *Fl. Dan.* 284. *With.* 1034.

Habitat in paluſtribus. Maio, Junio.

Radix fibroſa, perennis. *Folia* pallidè viridia, erectiuſcula patula, ad margines carinaſque, præcipuè apicem verſus aſpera, anguſta. *Culmus* ſub inflorescentiâ circiter 3-uncialis erectus foliis duplo

brevior, triqueter, angulis obtuſiuſculis obſoletè aſperiuſculis, mox pedalis & foliis longior. *Spica* compoſita androgyna, ſpiculis ſub-ternis, remotis, ovatis, ſeſſilibus: ad ſpiculam inferiorem ſæpius bractea, baſi ovata, in foliolum ſetaceum culmo brevius deſinens; ad cæteras oblonga eſt, membranacea, fuſca, aphylla. *Flores* inferiores maſculi laxius imbricati, ſuperiores fœminei plures. Squamæ ovatæ, acutæ, fuſcæ, margine membranaceo albo, nervo dorſali lato viridi, capſulâ maturâ breviores. *Capſula* oblonga acuminata, hinc plana, illinc convexiuſcula, divergens, apice acuto ſub-indiviſo. *Filamenta* tria, antheris linearibus flavis. *Stylus* ſtigmatibus duobus.

This little plant is well known to every botaniſt. It ſtands in competition with none of its fraternity, and therefore cannot be miſtaken.

It varies in height from three to ten inches, according to its ſoil and ſituation. On the Brecknockſhire hills I have found it above a foot high.

A floral leaf ſometimes, but by no means conſtantly, ſubtends the loweſt ſpicula.

It is well obſerved by *Haller*, that this ſpecies differs from *muricata*, by having the point of the capſule acute, and not bifid.

5. CAREX CURTA.

C. ſpiculis ſub-ſenis ovatis remotiuſculis nudis, ſquamis ovatis acutiuſculis capſulâ brevioribus.

Gramen cyperoides ſpicis curtis divulſis. *Loeſel. Pruſſ.* p. 117. t. 32.

C. elongata, *Leers*, p. 200. t. 14. f. 7.

C. caneſcens, *Lightfoot*, *Fl. Scot.* p. 550.

C. brizoides, *Hudſ. Fl. Angl.* p. 406.

C. cinerea, *Withering*, p. 1033.

Habitat, ſed rarius, in paluſtribus & aquoſis. Junio.

Radix ſub-repens, perennis. *Folia* pallida ſub-glauca, ad margines carinamque aſpera, erecta anguſta. *Culmus* pedalis aut paulò altior, foliis paulò longior, erectus, triqueter, angulis acutis aſperiuſculis. *Spica* compoſita androgyna, ſpiculis ſex & ultra, erectis ovatis ſeſſilibus alternis; ad ſpiculam inferiorem bractea, ſed rarius, foliaceâ ſetacea, ad cæteras ovata alba tenera membranacea. *Squamæ* albæ membranaceo-ſericeæ, ovatæ, acutæ, concavæ, nervo dorſali viridi, capſulâ paulò breviores. Flores inferiores maſculi. *Capſula* ovata, acuta; hinc plana, illinc convexiuſcula, ſub lente punctulatiſſima, marginibus integris, ore indiviſo. *Filamenta* tria, antheris linearibus flavis. *Stylus* ſtigmatibus duobus.

That this *Carex* ſhould have occaſioned ſome difficulty is not to be wondered at, when *Linnæus* himſelf ſeems to have forgotten his own original determination upon the matter. In Sir *Joſeph Banks*'s herbarium there is a *Carex* named *brizoides*, which anſwers entirely to the Linnean deſcription; "*Spicâ compoſitâ* DISTICHA *nudâ*, *ſpiculis androgynis* OBLONGIS CONTIGUIS, *culmo nudo*," in the *Sp. Plant.* p. 1381; to the ſynonym of *Haller*; and to the figure of *Michelius*, t. 33. f. 17. there quoted.

In the Linnean herbarium, the plant I am now ſpeaking of is named *brizoides* by *Linnæus* himſelf, and it accords with the ſynonyms of *Ray* and *Moriſon* quoted in the *Sp. Pl.* under *brizoides*. Still, however, as the figure of *Michelius* is a more pointed authority than the verbal deſcriptions of the authors juſt mentioned, I cannot but think that the plant in Sir *Joſeph*'s herbarium is what was originally deſcribed and intended for *brizoides*: accordingly I ſhall beg leave to accept it as ſuch, and name this anew. For, at all events, it cannot anſwer to the deſcription of *Linnæus*, for the ſpike

ſs never diſtich, the ſpiculæ are never oblong or contiguous. Hence has ariſen frequent error: Mr. *Lightfoot*, amongſt the reſt, rejected the idea of this being *brizoides*, and called it *caneſcens*.

But the C. *caneſcens* of *Linnæus* is ſimilar in ſhape to *curta;* ſo much ſo, that the figure in *Loeſel* is as applicable almoſt to the one as the other: but when they are brought together, the wideſt difference preſents itſelf. The *curta* is ſmaller in all its parts; then the ſquamæ are ſilvery, and very tender: in the *caneſcens* they are membranaceous and hard, as in the reſt of the genus, and are brown with a white edge, which gives it a real hoary appearance. We may gather from this circumſtance, how neceſſary coloured figures are to mark the nicety of diſtinction requiſite to aſcertain ſome ſpecies in natural hiſtory. It is true, it makes the ſtudy very expenſive; but it muſt be allowed, that unleſs very accurate deſcriptions accompany the uncoloured print, a difficulty of aſcertainment may after all ſubſiſt.

The *capſules*, together with the *ſquamæ* of this ſpecies, are very early deciduous: I know not any Carex in which this impoveriſhment takes place ſo early, except in *C. ſtricta.* The whiteneſs and tenderneſs of the ſquamæ in this ſpecies are ſtriking circumſtances. Theſe qualities are not to be found in any other. The root, though it cannot be called directly creeping, has a tendency to increaſe itſelf ſomething in that way. The *brizoides* of Sir *Joſeph Banks*'s herbarium has evidently a creeping root. As it is the only ſpecimen that I have ever ſeen, I will beg leave to ſubjoin a deſcription of it.

Radix repens, perennis. *Folia* pallidè vireſcentia, tenuia, culmo longiora, ad margines carinamque aſpera, inferiora (uti ſæpius accidit) breviora, & culmi baſin obveſtientia. *Culmus* triqueter, angulis acutis aſperis, erectus, nudus. *Spica* androgyna—Spiculæ circiter ſeptem, teretes ſ. oblongiuſculæ, ſub-diſtichæ, approximatæ, ſæpius

 contiguæ.

contiguæ. Flores inferiores maſculi. *Squamæ* oblongæ, acutæ, pallidæ, nervo dorſali viridi, teneriuſculæ, margine albo tenerrimo, capſulas ſub-æquantes. *Capſulæ* oblongæ, acutæ, glabræ, marginibus ſerrulatis, ſub-triquetræ, hinc planæ, ore diviſo. *Filamenta* tria—*Stylus* ſtigmatibus duobus.

As I take it for granted that *C. curta* is not the *brizoides* of Linnæus, and as the names of ſubſequent authors are not expreſſive of its diſtinction, I have reſtored *Loeſel*'s name, *curta*. *Linnæus* applies this figure of *Loeſel* to his *caneſcens*, but, I have always thought, without ſufficient authority; and I am happy in being countenanced in this idea, by our worthy Preſident's remark in his edition of the *Flora Lapponica*. See n. 332.

The true *C. brizoides* is very properly deſcribed by *Schreber*, in his *Spicilegium Fl. Lipſ.* p. 63. n. 675.

6. CAREX OVALIS.

C. ſpiculis ſub-ſenis ovalibus approximatis alternis, ſquamis lanceolatis capſulam æquantibus. *Buddle*, *Hort. Sic.* p. 31. n. 2. *Pet. Hort. Sic.* vol. 1. p. 163. n. 2.

Gramen cyperoides majus ſpicâ divulſâ. *Moriſ. Hiſt. Ox.* III. 244. ſ. 8. t. 12. f. 29.

Gramen cyperoides ſpicâ e pluribus ſpicis mollibus compoſitâ. *Scheuchzer*, 456. t. 10. 15.

C. leporina. *Fl. Angl.* p. 404. *Fl. Scot.* 547. *Pollich*, n. 874. cujus deſcriptio bona. *Leers*, 199. t. 14. f. 6. *quoad formam ſcilicet, at non ſitum florum maſc. & fœmin. Withering*, 1029.

Habitat in paluſtribus & pratis humidis. Junio.

Radix fibroſa, perennis. *Folia* faturatè viridia, ad oras carinaſque aſperiuſcula, anguſta, culmum ſub-æquantia. *Culmus* erectus, pedalis, tri-

triqueter, angulis acutis, aſperiuſculis. *Spica* androgyna compoſita, ſpiculis ſubſenis approximatis alternis ſub-ovalibus. Ad baſin ſpiculæ inferioris bractea baſi ovata in ſetam ſpiculæ ſuæ longitudine deſinens, ad cæteras bractea oblonga eſt & aphylla. *Flores* inferiores maſculi pauciores, cæteri plures fœminei. *Squamæ* ovato-lanceolatæ, acutæ, capſulam æquantes, fuſcæ, margine albo, nervo dorſali viridi. *Capſulæ* oblongæ acuminatæ, hinc planæ, illinc convexiuſculæ, erectæ, ore integro. *Filamenta* ut in cæteris—*Stylus* ſtigmatibus duobus.

It has been lately diſcovered, that we have all along been miſtaken in this very common plant. The error perhaps reſts with *Linnæus* himſelf, who joined the plant, he originally named *leporina*, with this we are now treating of. The miſtake took place even ſo early as the publication of *Fl. lapponica*, as appears from his quoting *Moriſon*'s figures. The original *leporina*, now preſerved in Dr. *Smith*'s (the Linnean) herbarium has only three ſpikelets, is a plant much ſmaller, and differs in many reſpects.

C. *ovalis* is diſtinguiſhable in all its ſtages from others by the number of the ſpiculæ, the acuteneſs of the ſquamæ, and the ſituation of the male and female flowers. In this the male flowers are at the baſe of the ſpikes, and few in number; the female ones numerous, and terminal.

Leers deſcribes his *leporina* as having the terminal florets male, and the inferior female. Although therefore his figure is a very exact repreſentation in other particulars, the ſituation of the male and female flowers muſt not be taken from his deſcription.

7. CAREX REMOTA.

C. ſpiculis axillaribus ſolitariis remotis ſubſeſſilibus, foliolis longiſſimis, capſulis apice indiviſis. *Buddle, Hort. Sic.* p. 31. n. 5.

Carex anguſtifolia, caule triquetro, capitulis pulchellis ſtrigoſioribus compactis, inter ſe diſtantibus, & in foliorum alis ſeſſilibus. *Mich. Gen.* 70. t. 33. f. 15, 16.

Gramen cyperoides anguſtifolium ſpicis parvis ſeſſilibus in foliorum alis. *Moriſ. Hiſt. Ox.* III. 243. ſ. 8. t. 12. f. 17. *Leers*, t. 15. f. 1. *Fl. Cantab.* n. 683. *Fl. Angl.* 407. *Withering*, 1035. *Pollich*, n. 878. *Fl. Scot.* 549. *Fl. Dan.* 370.

Habitat in ſylvis humidis, & ad ripas udas foſſarum. Maio, Junio.

Radix perennis, fibroſa. *Folia* radicalia anguſtiſſima compreſſa, marginibus omnino, at ſolum apicem verſus carinâ aſpera, culmo ſub tempore inflorescentiæ longiora—Caulina, quæ & bracteæ dicantur, ad baſin ſpicularum ſita (ſcilicet ad omnem ſpicam unicum ſeſſile anguſtiſſimum) duo infima culmum fere ſemper cætera aliquando ſuperant, carinâ marginibuſque aſpera. *Culmus* tenuis, debilis, erectus, triqueter, angulis acutis ſupernè aſperis, infra bracteam inferiorem glabris. *Spica* compoſita androgyna, ſpiculis circiter 10, ovatis axillaribus ſolitariis remotis ſubſeſſilibus—Flores maſculi inferiores. *Squamæ* ovatæ, acutæ, fuſceſcentes, membranaceæ, nervo dorſali viridi. *Capſulæ* ovatæ, acutæ, hinc planæ, illinc convexiuſculæ, lateribus apicem verſus ſerrulatis, apice indiviſo. *Filamenta & antheræ* ut in cæteris. *Stylus* ſtigmatibus duobus.

There is no difficulty in determining this ſpecies—There is only one in the whole family which has any affinity to it, viz. C. *axillaris;* but that is readily diſtinguiſhed by having three or more ſpikelets at the baſe of each bracteaceous leaf.

8. CAREX

8. CAREX AXILLARIS. Tab. 19. *fig.* 1.

C. ſpiculis axillaribus, ſubternatis, remotis, ſeſſilibus, foliolis longis, capſulis apice diviſis.

Præcedentis (remotæ) inſignis varietas, ſi non ſpecies diſtincta. *Buddle, Hort. Sic.* p. 31. n. 6.

Habitat prope Putney—Dom. *Curtis*, inter rariores. Maio, Junio.

Radix perennis, fibroſa—*Folia* radicalia anguſta, compreſſa, marginibus omnino, carinâ circiter dimidiam partem aſperis, culmo etiam ſub infloreſcentiâ brevioribus: Caulina, quæ & bracteæ dicantur, ad baſin ſpicularum ſita ſunt, ſcilicet ad omnem ſpicularum aggregationem unicum, ſeſſile, quorum infimum culmo longius, cætera breviora; omnia marginibus carinâque aſperrima. *Culmus* erectus, firmus, ſtrictus, triqueter, angulis acutis, etiam infra bracteam inferiorem aſperrimis, 1—fere 3-pedalis. *Spica* androgyna interrupta, ſpiculis axillaribus, inferioribus ſub-ternis, quandoque quaternis, quinis, ad baſin foliorum caulinorum ſ. bractearum, oblongæ, ſeſſiles, aggregatæ—Flores inferiores maſculi—Squamæ ovatæ, acutæ, fuſceſcentes, membranaceæ, nervo dorſali viridi, capſulam ſub-æquantes. *Capſulæ* ovatæ, acutæ, hinc planæ, illinc convexiuſculæ, lateribus apicem verſus ſerrulatis, apice diviſo. *Filamenta* ut in cæteris. *Stylus* ſtigmatibus duobus.

The great difference between this and *remota*, to which it ſeems moſt allied, is, that *axillaris* has a ſtrong and rigid culm, *remota* a ſoft, thin, and weak one. *Axillaris* has its ſpiculæ in the baſe of the leaves by threes, ſometimes by fives, particularly the lowermoſt.

The

The *remota* never has more than one ſpikelet at the baſe of each leaf. *Remota* has its capſules entire at the apex—*Axillaris* bifid.

Linnæus, in his *Sp. Pl.* ſeems to have deſcribed *C. remota* twice over, under the names of *axillaris* and *remota*. Whether he had ſeen this ſpecies, or whether he deſcribed *remota* twice through mere inadvertence, I know not. No perſon, I believe, has noticed this ſpecies, except Mr. *Buddle*, who very properly queſtions the propriety of its being claſſed with *remota*.

I am indebted to my very intelligent friend Mr. *Curtis* for roots of this plant, who firſt found it near *Putney*.

9. CAREX INCURVA.

C. ſpicâ conicâ ſpiculis plurimis congeſtis ſeſſilibus compoſitâ, involucro nullo, culmo incurvo. *Lightfoot Flora Scot.* p. 544. pl. 24. *Fl. Dan.* 432.

Carex juncifolia. *Allioni Fl. Pedemont.* 2296. t. 92. f. 4.

Having never had the good fortune of ſeeing this plant growing, and having only imperfect ſpecimens of it, I muſt refer to Mr. *Lightfoot*'s deſcription and figure. Mr. *Lightfoot*'s figure repreſents the plant in flower: in its ſeeding ſtate it loſes ſomething of its conic form, and becomes obtuſe. The capſules are ſomewhat oblong and acute, and a little longer than the ſquamæ, which are ovate, and ſomewhat acute.

When honoured with permiſſion to conſult her *Majeſty*'s herbarium, I ſaw Mr. *Lightfoot*'s original ſpecimen. Fearful of doing any injury by handling it, I forbore taking a minute deſcription of it. It ranks next to *C. arenaria*, from which it is ſufficiently diſtinct, by its conic and compact ſpike.

10. CAREX ARENARIA.

Spicâ foliosâ oblongâ acutiuſculâ, ſpiculis plurimis; terminalibus maſculis; inferioribus fœmineis, culmo incurvo. *Buddle, Hort. Sic.* p. 31. n. 7. *Mich. Gen.* p. 67. n. 1 & 2. f. 3. *quoad figuram ſpicæ*, & f. 4.

Carex arenaria. *Leers*, t. 14. f. 2. *Fl. Suec.* n. 835. *Fl. Angl.* p. 404. *Fl. Scot.* 545. *Withering*, 1029.

Habitat in arenoſis maritimis. Junio.

Radix valde repens, craſſa, ramis divaricatis. *Folia* anguſta, nigro-viridia, ad margines carinamque aſperiuſcula, variantia culmo breviora, longiora. *Culmus* incurvus, 4-12 uncialis, triqueter, angulis acutis ſcabriuſculis. *Spica* compoſita ſpiculis circiter 7-16 oblongis, androgynis, ſurſum imbricatis, infernè remotiuſculis, bracteatis, bracteis foliaceis, inferioribus brevibus, in folium tenuiſſimum deſinentibus; ſuperioribus ovatis membranaceis ſub-aphyllis. In omni fere ſpiculâ flores terminales maſculi—Spiculæ inferiores ſub-fœmineæ, ſuperiores ſub-maſculæ. Squamæ ovatæ, acutæ, (longo ſæpiùs acumine), capſulas maturas æquantes. *Capſulæ* ovatæ, acuminatæ, hinc planæ ſulcatæ, illinc carinatæ, apicem verſus utrinque alatæ ſ. margine membranaceo, ore bifido. *Filamenta* & *antheræ* ut in cæteris. *Stylus* ſtigmatibus duobus.

Mr. *Lightfoot*'s deſcription of this plant is very well drawn: but I have ſpoken ſufficiently of it under *C. intermedia*. It is not uſually found but in the vicinity of the ſea-ſhore, and there, for the moſt part, in looſe ſand. I have been told that it has been found in the inland parts of Germany, in ſand, which evidently appears to be the ſame as what we call ſea-ſand, and, perhaps, before the diluvian wreck of the world, had its place on the ſea-ſide.

I have often brought roots of it into my garden, but they would never flouriſh handſomely. They exiſt indeed, but ſcarcely ever produce flowers, and ſhew every token of diſtaſte and diſaffection.

I have ſcarcely a doubt but that *Michelius* was deceived in the ſpecimens ſent him, and drew his figure t. 33. f. 3. (which is quoted under *C. diſticha* of Mr. *Hudſon*) from an old dried ſpecimen of *C. arenaria*, as any one may judge who will compare the ſpecimens of that plant, which he will find withering in the months of Auguſt and September. Had the culm been repreſented incurved, I could have had no doubt. *Michelius* received his ſpecimens from London and Paris.

11. CAREX INTERMEDIA.

C. Spicâ oblongâ obtusâ, ſpiculis plurimis; infimis terminalique fœmineis; intermediis maſculis, culmo erecto. *Buddle, Hort. Sic.* p. 31. n. 4.
C. arenaria, *Leers*, t. 14. f. 2.
C. diſticha, *Fl. Angl.* p. 403. *Fl. Scot.* 546. *Withering*, 1028.
C. ſpicata, *Pollich*, n. 875.

Habitat in paluſtribus. Junio.

Radix valdè repens, craſſiuſcula, perennis—*Folia* ſaturatè viridia, erecta, ad margines carinamque aſperiuſcula, culmo ſæpe breviora. *Culmus* erectus, firmiuſculus, triqueter, angulis acutis aſperis, pedalis & ultra, nudus. *Spica* androgyna, compoſita, ſpiculis 8-20 approximatis, ſurſum imbricatis, ovatis, circiter tribus infimis & terminali ſub-fœmineis, cæteris ſub-maſculis—in fœmineis ſcilicet ſæpiùs flos unus aut alter maſculus, & in maſculis fœmineus conſpiciendus eſt. *Flores* fœminei ſemper inferiores. Ad ſpicam infe-

riorem

riorem bractea baſi ovata, ſupernè in foliolum ſetaceum longiuſculum deſinens—ad cæteras, bractea ovata ſub-aphylla. Squamæ fuſcæ, ovatæ, acutæ, capſulas æquantes, nervo carinali concolore. *Capſula* oblonga, acuminata, ore diviſo, hinc plana, illinc convexiuſcula lateribus (oculo bene armato), membranâ ſub-lacerâ ſ. ferrulatâ marginatis. *Filamenta & antheræ* ut in cæteris. *Stylus* ſtigmatibus duobus.

The name *diſticha* (which by no means correſponds with its growth) being applied to this plant, has occaſioned its being not well known: *Pollich* revolts at the idea, and calls it *ſpicata*. Mr. *Lyons* obſerves, that the ſpike is *vix diſticha*. As the leading character in this *Carex* is its having generally the intermediate ſpiculæ almoſt entirely male, I have ventured to apply a name which has immediate reſpect to this uncommon circumſtance.

The *C. intermedia* and *arenaria* approach ſo nearly to each other, that I ſcarcely know what to make of the deſcriptions which ſome authors have given of them—I apprehend that they have truſted too much to their place of growth: no dependance can be placed on that matter. Although *C. intermedia* does not grow in ſand, yet it is by no means unuſual to find *arenaria* in meadows by the ſea-ſide. Mr. *Lightfoot* had not a correct notion of *intermedia* (his *diſticha*), for he ſays it differs from *C. arenaria* by *not* having a creeping root, whereas in fact no *Carex* is more ſtrongly endowed with this injurious quality. *Pollich*'s deſcription is not accurate, for he takes no notice of the female terminal ſpikelet. *Leers*, always accurate, rightly attends to this prominent feature: no one can miſtake his figure.

Some of the ſpiculæ in this ſpecies, and in *arenaria*, being purely male, and others female, would almoſt juſtify the claſſing of them amongſt thoſe *ſexu diſtinctas*—but it is not conſtant enough to war-

rant ſuch a ſtep as that; beſides, the habit is altogether that of the androgynous ones. For although *Leers* ſays he found the intermediate ſpikelets purely male, yet in almoſt all of them two or three female flowers are to be ſeen at the baſe; and thus in the female ſpiculæ, male flowers from 1—3 at the ſummit. A few ſpiculæ are truly androgynous.

After all it muſt be allowed, that *intermedia* and *arenaria* are very nearly allied. Notwithſtanding the obſcurity thrown over theſe plants by the confuſion ariſing from wrong ſynonyms and imperfect deſcriptions, yet there is character enough peculiar to each. In *intermedia*, the root creeps deeply under ground, and in a very irregular manner. In *arenaria*, it creeps juſt below the ſurface, and while the main ſhoot runs in a ſtraight line, ſide-ſhoots ſtrike off at right angles; it makes a beautiful appearance by this means, forming, with the ſhoots it ſends up, *parterres*, &c. which become at once its ornament and diſtinction. In *intermedia* the culm is erect, in *arenaria* incurved. In *intermedia*, the ſpike (the terminal ſpicula being feminine) is obtuſe: in *arenaria* (many of the terminal ſpiculæ being almoſt entirely male) it is acute. In *intermedia*, the capſule has its margin entire; in *arenaria*, it is marginated on each ſide towards the apex with a broadiſh membrane.

I have never met with the variety β of Mr. *Hudſon*. I have obſerved indeed, occaſionally, ſome of the ſpikes with very few ſpiculæ; but I never found any plant throwing up all its culms in general with ſo few ſpiculæ as are repreſented in *Plukenet*'s figure. Dr. *Withering* ſuppoſes this figure to be a repreſentation of Mr. *Hudſon*'s *C. brizoides*.

Leyſer can ſcarcely be ſuppoſed to know Mr. *Hudſon's C. diſticha*; for he ſays, *Nulla laudabilis figura hujus Caricis quantum novi extat, Moriſ.* Hiſt. 3. ſ. 8. t. 12. f. 32. *illi quodammodo ſimilis.* See *Leyſer's Fl. Hal. C. diſticha.*

But

But *Leers*'s figure is moſt excellent, which work he quotes. See *Carex acuta, Fl. Hal.* n. 959.

12. CAREX DIVISA. Tab. 19. *fig.* 2.

Spicâ ovatâ ſub-decompoſitâ foliolo erecto inſtructâ, ſpiculis ſub-confertis, capſulis adpreſſis, radice repenti. *Buddle's Hort. Sic* p. 31. n. 3. *Fl. Angl.* p. 405.—*Withering*. p. 1033.

Habitat in paluſtribus maritimis. Maio, Junio.

Radix valdè repens, craſſa, perennis. *Folia* ſaturatè viridia, erecta, ad margines carinaſque aſperiuſcula, culmo longiora, anguſta, apicem verſus tenuiſſima. *Culmus* erectus, debilis, pedalis & ultra, ad ſpicam folioſus foliolo fæpiùs longiſſimo (variat autem & brevi, immò breviſſimo) tenui, erecto, triqueter angulis acutiſſimis (variat etiam obtuſiuſculis) aſperiuſculis. *Spica* compoſita eſt ubi nec rarò decompoſita, quippe ad baſin ſpicæ diviſio fit, unde decompoſitio oritur. Scilicet ramulus breviſſimus, ſi fas ſit hoc nomine appellare, ſpiculas quaſdam ovatas confertas gerit. Sub omni ſpiculâ bractea fuſca, oblonga, inferius lata, apice in ſetam brevem deſinens, ſubtenditur. Spiculæ ovatæ, ſub-contiguæ, erectæ, floribus terminalibus maſculis. Squamæ fuſcæ, ovatæ, acutiſſimæ, capſulâ longiores. *Capſulæ* ovatæ, acutæ, hinc ſub-cavæ, illinc gibbæ, arctè imbricatæ, rachi appreſſæ, nec minimè patentes, apicem verſus ſub-membranaceo-marginatæ. *Filamenta* ut in cæteris—*Stylus* ſtigmatibus duobus; & iiſdem, fæpiùs præ maritos tardos exſpectando, longioribus.

I have not ventured to adduce any ſynonyms from *Lobel*, *Gerard*, or *Parkinſon*. The ſimilarity between this and *muricata* is in ſome ſtages of growth and ſituations too cloſe to be kept apart by ſuch rude figures.

This

This plant varies very much—ſometimes the culm is triquetrous with very ſharp angles, ſometimes it is rather blunt; ſometimes the erect floral leaf is extremely ſhort, ſometimes it is extended to a great length: but the root is always very thick and creeping; the leaves very narrow and erect; the culm very thin, and has the habit of a *Scirpus*.—The ſpike has its ſpikelets ſub-contiguous, often crowded; and the capſules are cloſely imbricated, and rather turning inward, not at all ſpreading or opening.

The male flowers, which in this ſpecies terminate the ſpikelets, appear very late, which often occaſions a conſiderable elongation of the ſtyles waiting for their impregnation. Perhaps this circumſtance might be urged as a collateral proof of the truth of the ſexual ſyſtem.

13. CAREX MURICATA.

Spicâ oblongâ ſub-decompoſitâ, ſpiculis diſtinctis, capſulis divergentibus ore fiſſo, radice fibroſâ. *Buddle, Hort. Sic.* p. 32. n. 3. *Petiver. Hort. Sic.* vol. 1. p. 166. n. 4.

Gramen ſylvaticum tenuifolium rigidiuſculum. *Moriſ. Hiſt. Ox.* III. ſ. 8. t. 12. f. 27.

Gramen cyperoides minus ſpicis minoribus minuſque compactis. *Scheuchzer*, 488. t. 11. f. 5.

Carex nemoroſa, fibroſâ radice, anguſtifolia, minimâ caule exquiſitè triangulari, ſpicâ brevi interruptâ. *Michel.* p. 69. t. 33. f. R, and fig. 14. *Fl. Suecica*, n. 839.

C. ſpicata. *Flo. Angl.* 405. *Withering* 1032. *Flora Scot.* 548.

Habitat in ſylvis & pratis humidis. Maio, Junio.

Radix fibroſa, perennis. *Folia* amœnè viridia, anguſta, ad oras carinaſque aſpera, culmo longiora. *Culmus* erectus, pedalis & ultra, triqueter,

triqueter, angulis acutis aſperis. *Spica* androgyna, compoſita, ſæpe decompoſita: ſpiculæ circiter decem, infernè remotæ, ſupernè contiguæ, ovatæ, ſeſſiles, apice maſculæ, bracteatæ bracteâ baſi ſubovatâ, ſupernè in foliolum ſetaceum hiſpidum deſinenti—hæc bractea ad inferiores ſpiculam ſuam longè ſuperat—Squamæ ovatæ, acutæ, capſulâ breviores, fuſcæ, margine membranaceo albo, nervo dorſali viridi. *Capſulæ* ovatæ, acutæ, hinc planæ, illinc convexæ, glabræ, ad margines ſupernè hiſpidiuſculæ, ſub-divergentes, ore biſido. *Filamenta* ut in pleriſque. *Stylus* ſtigmatibus duobus.

The Linnean herbarium countenances my differing from the authors of our country in the naming of this plant *C. muricata*; for it ſtands there ſo inſcribed by *Linnæus* himſelf. Indeed the little plant which is uſually called *muricata*, by no means juſtifies the accuracy of appellation for which *Linnæus* was ſo remarkable. On the contrary, this plant fully correſponds with the appearance which might be expected from that name.

I am very fully perſuaded that *Linnæus*, and after him the Swediſh botaniſts, confounded the two plants. This appears pretty evident from the figures quoted by *Linnæus*; and it is but fair to imagine that they thought it varied from ſoil and ſituation. *Haller*, in his hiſtory, n. 1366, ſays he received Mr. *Hudſon*'s *muricata* from *Sweden* under the name *muricata*. This circumſtance, and *Linnæus*'s naming this plant of which I am now ſpeaking *muricata* alſo, confirm me in my idea.

C. muricata differs from *vulpina*, by never having its ſpike ſupradecompoſite, nor the culm enlarged beneath the ſpike. It differs from *C. diviſa* of Mr. *Hudſon*, by its fibrous root, and by having its capſules diverging, and no erect leaf under the ſpike. It differs from *ſtellulata*, by its numerous and contiguous ſpiculæ, and its capſules divided at the ſummit.

Var.

Var. β. There is a variety rather ſlenderer in its form, with its ſpike rarely decompound—The culm is not ſo rough on its angles, and towards the baſe it is roundiſh, inſomuch that many have taken it for *diviſa* of *Hudſ.* inclined ſo to do by his ſpecific deſcription, and by *Parkinſon*'s ſynonym. *Michelius*, t. 33. f. 12, and *Scheuchzer*, t. 11. f. 5. are rather repreſentations of this variety. A plant of it is preſerved in vol. 12. of *Uvedale's Herb. Rayanum*, p. 72. n. 2.

14. CAREX DIVULSA.

Spicâ decompoſitâ elongatâ baſi ſub-ramosâ, ſpiculis inferioribus remotis; ſummis contiguis, capſulis ſub-erectis. *Buddle, Hort. Sic.* p. 32. n. 4. *Pet. Hort. Sic.* p. 166. n. 2. and p. 167. n. 1.

Carex nemoroſa, fibroſâ radice, caule exquiſitè triangulari, ſpicâ longâ divulsâ ſeu interruptâ, capitulis ſolitariis, præterquam ultimo. *Mich. Gen.* 69. t. 33. f. 10. *Withering*, 1035.

C. caneſcens, *Fl. Ang.* 405.

Habitat in nemoroſis humidis. Maio, Junio, Julio.

Radix perennis, fibroſa. *Folia* ſaturatè viridia, ſubanguſta, carinâ marginibuſque aſperis, culmo longiora. *Culmus* pedalis, ſeſquipedalis, debilis, ſub-reclinatus, triqueter, angulis acutis aſperiuſculis. *Spica* interrupta, elongata, baſi ſub-ramoſa, androgyna—Spiculæ inferiores remotæ, plurimæ, ovatæ, ſeſſiles, bracteis ſetaceis hiſpidis; ſuperiores contiguæ floribus maſculis terminalibus. Squamæ membranaceæ, albæ, ovatæ, mucrónatæ, nervo dorſali viridi qui in mucronem exit, capſulis longiores. *Capſula* ovata, acuta, hinc plana, illinc convexiuſcula, erectiuſcula, ore bifido. *Stamina* tria. *Stylus* brevis, ſtigmatibus duobus.

The figure of *Michelius* is too accurately drawn to admit of any doubt in the application of it: neither would this plant have ever come into diſpute, had not *Loeſel*'s figure t. 32, been adduced to repreſent it. How that miſtake aroſe I know not—It ſeems to have originated with Mr. *Ray** himſelf. See *Ray Syn.* p. 424. *Loeſel*'s figure aptly enough repreſents *Linnæus*'s *C. caneſcens* and *Hudſon*'s *brizoides*, particularly the latter, for the outline of both is nearly the ſame: but it has nothing to do with C. *divulſa.*

Carex *divulſa* has a weakiſh reclining culm, a long interrupted ſpike, with one or two branches at the baſe; the ſpikelets are remote; and the capſules, though ſtanding looſe and a little ſpreading, yet are not diverging. This laſt circumſtance is worth attending to, as it keeps it diſtinct from thin ſtarved ſpecimens of Carex *vulpina*, as figured by *Leers*, t. 14. f. 3.

15. CAREX VULPINA.

C. ſpicâ ſupra-decompoſitâ coarctato-ramosâ obtusâ, ſpiculis ſupernè maſculis, capſulis divergentibus, culmi angulis acutiſſimis. *Buddle Hort. Sic.* p. 32. n. 1.

Carex paluſtris major, radice fibrosâ, caule exquiſitè triangulari, ſpicâ brevi habitiori compactâ. *Mich. Gen.* 69. t. 33. f. 13.

Gramen cyperoides paluſtre majus. *Park.* 1266. *Moriſ. Hiſt. Oxon.* III. 244. ſ. 8. t. 12. f. 24.

Leers, t. 14. f. 5. *With.* 1030, where ſee an account of the ſeveral varieties of this ſpecies. *Fl. Dan.* t. 308. *Pollich.* n. 876. *Fl. Suecica*, n. 838. *Fl. Angl.* p. 404.

* Mr. *Ray* was in general ſo very accurate that it may be queſtioned whether later writers have not miſtaken him. *Loeſel*'s figure is ſo plain and characteriſtic, that it may be doubted whether *Ray*'s ſynonym does not actually relate to *Loeſel*, that is, to our C. *curta.*

Habitat paſſim in paluſtribus, & ad ripas foſſarum & fluviorum. Maio.

Radix fibroſa, perennis. *Folia* ſaturatè viridia, latiuſcula, ad oras carinaſque aſpera, culmum ſuperantia. *Culmus* erectus, firmus, rachi ſpicæ multo auctior, pedalis, bipedalis, triqueter, lateribus ſub-excavatis, & inde angulis acutiſſimis, aſperis. *Spica* androgyna, ſupradecompoſita, coarctato-ramoſa, oblonga, obtuſa, ramis diſtantibus rigidis. Ad baſin omnis rami, bractea baſi ovata, ſupernè in foliolum ſetaceum hiſpidum deſinens—Spiculæ ſeſſiles, ovato-rotundæ, ſupernè maſculæ—Squamæ ovatæ, acuminatæ, fuſcæ, membranaceæ, nervo dorſali viridi, capſulis paulò longiores. *Capſulæ* oblongæ, acuminatæ, hinc planæ, illinc convexiuſculæ, divergentes, ore bifido. *Filamenta* tria, antheris linearibus flavis. *Stylus* ſtigmatibus duobus.

Of this well-known ſpecies no doubt can be entertained.—The ſtoutneſs of its culm, the cloſeneſs and rigid nature of the ſpike, and its ſupradecompoſition, mark it very ſtrongly. Dr. *Withering* notes ſeveral varieties, but they all fall under the general deſcription which I have given above. To diſtinguiſh it ſtill more nicely from ſome of its affinities, obſerve—1. That the ſpike is furniſhed with many bracteæ ending in a ſetaceous leaf, and that the culm is moſt ſharply triangular, and the ſides are hollowed, or ſink in.—Then the capſules are divaricated. Moreover, the culm is enlarged below the ſpike, and ſeems ſuddenly contracted when it meets the rachis of the ſpike. Hence it ſeems to be very different from *muricata*, to which it is moſt nearly allied; and alſo from *teretiuſcula*, which has its culm ſomewhat roundiſh.

Leers fig. t. 14. f. 3. is a variety of this plant, and not *Carex divulſa*, as is evident from the diverging of the capſules.

16. CAREX TERETIUSCULA. Tab. 19. *fig.* 3.

Spicâ ſupra-decompoſitâ coarctato-ramosâ acutiuſculâ, ſpiculis glomeratis ſupernè maſculis, capſulis patentibus, culmo teretiuſculo.

Habitat in paluſtribus propè Norwich. *Dom. Crowe.* Maio.

Radix fibroſa, perennis. *Folia* viridia, erecta, rigidiuſcula, culmi ferè dimidium vaginantia, vaginâ ſuperâ hinc membranaceâ tranſverſim rugoſâ, baſi extus convexa, intus canaliculata, ſupernè carinata ut in cæteris accidit, oris carinâque aſpera, culmo florifero longiora—Folium ſuperum cæteris longius evadit.—*Culmus* florifer foliis $\frac{1}{3}$ brevior, triqueter angulis acutis aſperis, inter angulos autem quaſi torus longitudinalis prominulus, adeò ut culmus teretiuſculus viſus eſt. Culmus tandem pedalis, ſeſquipedalis evadit. —*Spica* androgyna, terminalis, ovato-oblonga, acutiuſcula, ſupradecompoſita, bracteâ infimâ breviſſimâ, baſi dilatatâ, utrinque membranaceâ fuſcâ, margine ipſo albo, in ſetam definenti ſpiculâ ſuâ breviori. Spiculæ & ſpiculellæ ovatæ, acutæ, ſeſſiles—Flores maſculi ſuperiores, plures; fœminei inferiores, circiter ſex—Squamæ fuſcæ margine albo membranaceæ, nervo dorſali viridi abbreviato, ovatæ, acutæ.—*Capſulæ* ovatæ, acutæ, hinc planiuſculæ, illinc convexæ, gibbæ, marginibus ſerrato-hiſpidis, patentes—Maturæ ſquamâ ſubtensâ $\frac{1}{6}$ longiores. *Filamenta* tria, antheris linearibus flavis. *Stigmata* duo.

I underſtand that Mr. *Crowe* of Norwich is the diſcoverer of this plant. It comes very near *C. paniculata*, but it is nearly twice as ſmall in all its parts.

As far as cultivating it three years will enable me to ſpeak, I will beg leave to ſtate a difference. Its ſpike is never in the leaſt panicled, but always cloſe: its ſeeds are remarkably gibbous on one ſide, which is not obſervable in *paniculata*: its culm is not triangular, like that of *paniculata*, but, owing to a prominent line running down the planes of the ſides, roundiſh—not but that it always retains ſomewhat of a triangular form, with its angles rough. Its leaves are erect, and uſually incurved—*Paniculata* has them always ſpreading. It differs in œconomy alſo, not forming thoſe large tufts of graſs for which *paniculata* is ſo remarkable.

It has no affinity to *vulpina*, for its capſules are never diverging, nor its culm enlarged beneath the rachis of the ſpike.

As the round appearance of the culm is an obvious mark of diſtinction, I reſt the ſpecific difference principally upon that circumſtance. The gibboſity of the capſule alſo is very conſtant.

Mr. *Curtis* favoured me with roots of this plant.

17. CAREX PANICULATA.

C. ſpicâ ſupra-decompoſitâ paniculato-ramosâ acutâ; ramis alternis remotiuſculis, capſulis patentibus, culmo triquetro. *Buddle Hort. Sic.* p. 31. n. 1. *Pet. Hort. Sic.* Vol. I. p. 163. n. 1. both varieties?

Cyperus alpinus longus inodorus, paniculâ ferrugineâ minus ſparsâ. *Scheuchzer* 499. *prod.* t. 8.

Carex radice repenti caule exquiſitè triangulari ſpicâ multiplici ferrugineâ & fuſcâ. *Mich. Gen.* 68. t. 33. f. 7.

Gramen cyperoides paluſtre elatius ſpicâ longiore laxâ. *Moriſ. Hiſt. Oxon.* III. 244. ſ. 8. t. 12. f. 23. *Sp. Plant.* p. 1383. *Leers*, t. 14. f. 4. *Pollich.* n. 882. *Fl. Angl.* 403. *Withering* 1036.

Habi-

Habitat in paluſtribus putridis & aquoſis. Junio.

Virginia Water.

Radix fibroſa, perennis. *Folia* viridia, ad oras carinaſque valdè aſpera, culmo longiora, ſub-anguſta, canaliculata, exteriora breviora. *Culmus* pedalis, 2-pedalis & ultra, infernè foliis obſitus, erectus, ſtrictus, triqueter, angulis acutioribus aſperis. *Spica* ſupra-decompoſita, paniculato-ramoſa, androgyna. Ad baſin cujuſque ramuli, bractea ovata in mucronem elongatum nonnunquam in ſetam deſinens, fulva, membranacea, margine albo. Ad omnem etiam ſpiculam unica ejuſdem formæ. Spiculæ inferæ remotæ, ſuperæ congeſtæ, ovatæ, omnes ſeſſiles, floribus inferioribus, circiter quatuor fœmineis, ſuperioribus pluribus maſculis—Squamæ ovatæ, concavæ, acutæ, membranaceæ, fuſcæ, margine albæ, carinatæ, carinâ ciliato-hiſpidâ, nervo dorſali viridi, capſularum fere longitudine. *Capſulæ* ovatæ, acutæ, laxæ, patentes, hinc planæ, illinc convexæ, ad margines ferrulatæ, acuminatæ, ore bifido. *Filamenta* tria, antheris linearibus flavis. *Stylus* brevis, ſtigmatibus duobus.

The lax branchy diſpoſition of the ſpike is a ſufficient mark of diſcrimination in this ſpecies. As the term *racemus compoſitus*, though ſcientifically exact, and applicable to this ſpecies, ſeldom occurs in the Linnean deſcription, I have changed it for one of a more general and popular nature, *ſpica paniculato-ramoſa.*

The branches are alternate, and ſomewhat diſtant from each other.—The capſules in this ſpecies are ſometimes ſomewhat diverging, and of the ſame length as the ſquama which guards them. —The whole ſpike is triquetrous, oblong, and acute at its firſt opening.

This *Carex* is admirably well qualified for planting in looſe boggy

boggy ground; its immenſe tufts forming firm ſupport for the heavieſt bodies.

The Var. β of *Withering*, upon being cultivated in a rich wet ſoil, formed its ſpike as branching as Var. α.

18. CAREX DIGITATA.

C. bracteis membranaceis ſub-aphyllis vaginantibus dimidiatis, ſpicis linearibus erectis: maſculâ breviori, capſulis diſtantibus.

Gramen caryophyllatum polycarpon fructu triangulo. *Loeſ. Pruſ.* p. 112. t. 27.

Gramen caryophyllatum montanum ſpicâ varia. *Bauhin. Prodr.* p. 9. *Scheuchzer*, p. 448. t. 10. f. 14.

Cyperoides montanum nemoroſum, caule triquetro, compreſſo, ſpicis ferrugineis tenuioribus inter ſe diſtantibus; capſulis rarius diſpoſitis, oblongis, turbinatis, trilateris. *Mich. Gen.* 65. t. 32. f. 9. *Leers*, t. 16. f. 4. *Fl. Angl.* p. 409. *Pollich.* n. 884. *Fl. Suecica*, n. 844. *Withering*, 1041.

Habitat in ſylvis & umbroſis propè Bath. *D. Sole.*

Radix fibroſa, perennis; partes quæ radici proximæ, ſeu culmi ſive folia ſint, omnes rubræ. *Folia* nigro-viridia, culmo inflorescenti longiora, marginibus ad baſin retrorſum hiſpidis, ad medium lævibus, apicem verſus antrorſum hiſpidis, carinâ læviſſimâ. *Culmus* 6—12 uncialis erectiuſculus, obſoletè triqueter, angulis obſoletis, baſi ſquamis ſtriatis vaginantibus in foliolum acutum breviſſimum deſinentibus obveſtitus. *Spicæ* ſexu diſtinctæ, terminalis maſcula, tres aliquando duæ ſubjectæ fœmineæ, omnes lineares—Spica maſcula tenuis, ſquamis rubro-ferrugineis, oblongo-ovatis, obtuſis, nervo dorſali viridi. Spicæ fœmineæ etiam tenues, circiter 7-floræ, pe-

dunculatæ, bracteâ membranaceâ ſub-aphyllâ (rariùs ſcilicet in foliolum breviſſimum acutum definit) dimidium pedunculi cujuſque amplectenti; ſuperior ad baſin ſpicæ maſculæ ſita eſt, & eandem altitudine ſuperat—cæteræ inferiores remotiuſculæ. Flores laxè imbricati, alterni, diſtantes—Squamæ ut in maſculâ capſulam æquantes. *Capſulæ* obovatæ, trigonæ, acutæ, pubeſcentes, apice indiviſo. *Filamenta* tria—*Stigmata* tria.

19. CAREX CLANDESTINA.

C. bracteis membranaceis ſub-aphyllis vaginantibus, ſpicis fœmineis remotis vaginam vix exſuperantibus.

Cyperoides montanum humile anguſtifolium, culmo veluti folioſo ſpicis obſeſſo. *Scheuchzer*, 407. t. 10. f. 1. *Mich. Gen.* 63. t. 32. f. 8. ex auctoritate cel. *Schreberi*, *Spic. fl. lipſ.* p. 65. n. 1013.

Habitat in rupe Sancti Vincentii dictâ, propè Briſtol. *D. Sole.*

Radix perennis, fibroſa. *Folia* tenuia, culmo triplo & ultra longiora, canaliculata, marginibus carinâque apicem verſus aſpera. *Culmus* brevis, erectus, teretiuſculus, hinc planiuſculus, glaber. *Spicæ* ſexu diſtinctæ, una maſcula, tres fœmineæ, omnes remotæ. Spica *maſcula* terminalis, oblonga, acuta, ſemuncialis, ſquamis fuſco-ferrugineis, ovato-oblongis, obtuſis, margine lato, membranaceo, albo, nervo dorſali viridi. Spicæ *fœmineæ* oblongiuſculæ, paucifloræ, pedunculatæ—Ad unamquamque ſpicam bractea membranacea, ſæpius aphylla, quæ non modo pedunculum, verum etiam ſpicam ipſam, ſæpius ſinu fovet. Hæc bractea nonnunquam in foliolum breviſſimum exit.—Squamæ ut in maſculâ, capſulam ſubæquantes. *Capſula* ovata, trigona, acutiuſcula, ore indiviſo. *Filamenta* ut in cæteris. *Stylus* ſtigmatibus tribus, longis.

If

If the very ſingular mode of growth in the C. *digitata* and *clandeſtina* did not ſtrike the eye of the moſt incurious, the membranaceous vagina would be a ſufficient diſtinction. In this ſpecies the ſpikes are pedunculated, but ſtill, in their flowering ſtate, rarely exceed the length of the vagina. This circumſtance, and the flowering culms themſelves being hidden among the leaves, induced me to call it *clandeſtina*. It flowers very early in the Spring, in the very beginning of April. He who cultivates it would do well to ſhelter it at that ſeaſon from froſt and wet, which often prevent it from ripening its ſeeds, or indeed opening its flower. It thrives in the garden, almoſt equally well in the common border, or in a watery ſituation. But all *Carices* certainly prefer moiſture.

This plant, as I am informed, has been ſpoken of by *Dick* and other pupils of *Haller* under the name of *argentea*, and by *Allioni* under the name of *proſtrata*. It is the *humilis* of *Leyſer* and of *Schreber*.

The leaves, which overſhadow the culms at their firſt appearance, are thoſe of the preceding year, which uſually continue green till their ſucceſſors are enabled to take their place, and continue the ſyſtem of protection.

20. CAREX PENDULA.

C. vaginis longis ſubæquantibus, ſpicis cylindricis longiſſimis pendulis, capſulis confertiſſimis ovatis acutis. *Buddle*, *Hort. Sic.* p. 28. n. 2. *Uvedale*, *Herb. Ray*, vol. 12. p. 65. A & B.

Gramen cyperoides ſpicâ pendulâ longiore. *Moriſ. Hiſt. Ox.* III. 242. ſ. 8. t. 12. f. 4. *Fl. Angl.* 411. *Withering*, 1046. *Fl. Scot.* 564. *Curtis Fl. Londinenſis.*

Habitat in ſylvis, & ſepibus frequentius. Maio, Junio.

Radix

Radix fibroſa, perennis. *Folia* lata, craſſa, rigida, nigro-viridia; ſubtus glauceſcentia; ad margines carinaſque aſperrima, culmo breviora. *Culmus* 2—6 pedalis, erectus, firmus, triqueter, angulis infernè acutis, ſupernè obtuſiuſculis, omnino glabris, niſi ad ſummum ubi internodium unum aut alterum aſperiuſculum eſt. *Spicæ* una maſcula, circiter ſex fœmineæ. Spica maſcula triquetra, angulis acutis, ſub-clavata, 2—4 uncialis, terminalis, ſquamis oblongis, acutis, fuſcis, membranaceis, nervo dorſali viridi. Spicæ fœmineæ cylindricæ, pedunculatæ, 4—6 unciales, pendulæ, bracteis longè breviores, remotæ, floribus inferioribus remotis, ſuperioribus arctiùs imbricatis. Squamæ membranaceæ, nigræ, oblongæ, acutæ, nervo dorſali viridi lato. Ad baſin omnis pedunculi bractea, ſ. folium vaginans longum, vagina plerumque pedunculi longitudine. *Capſula* ovata, triquetra, glabra, acuta, ore indiviſo, ſquamâ ſuâ longior. *Filamenta* tria. *Stylus* ſtigmatibus tribus.

The great ſize of this Carex, and its very long pendulous cylindrical ſpikes, enable the botaniſt to diſcriminate it at a great diſtance—It has remarkably ſmall capſules for its ſize.

21. CAREX STRIGOSA. Tab. 20, *fig.* 4.

C. vagin' longis ſubæquantibus, ſpicis filiformibus laxis pendulis, capſulis oblongis ſub-triquetris acutis.
Uvedale, Herb. Rayan. vol. 12. p. 64. n. 2. *Fl. Angl.* 411. *Withering*, 1047.

Habitat in ſylvis & ſepibus—In ſylvâ Witham dictâ, propè Oxoniam. *Dr. Sheffield.* Aprili, Maio.

Radix fibroſa, perennis. *Folia* lætè viridia, lata, marginibus carinâque aſperis. *Culmus* erectus, 2-pedalis & ultra, triqueter, angulis acutis glabris, foliis longior. *Spicæ* unica maſcula, circiter ſep-

tem fœmineæ. Spica maſcula terminalis, linearis, teretiuſculus, biuncialis, recta. Squamæ pallidè virentes, ovato-oblongæ, acutæ, margine membranaceo, albo, nervo dorſali lato, viridi. Spicæ fœmineæ circiter ſeptem, omnes filiformes, teretes, remotæ, primò erectæ, mox pendulæ, pedunculatæ, floribus laxè imbricatis; ſuperiores ſæpiùs floribus aliquot maſculis terminalibus. Squamæ ut in maſculâ. Ad baſin omnis pedunculi bractea, ſ. folium vaginans, ſatis longum, vaginâ pedunculi longitudine. *Capſula* oblonga, triquetra, acuta, ore indiviſo, ſquamâ demum fere duplo longior. *Filamenta* tria, antheris linearibus, pallidè flavis. *Stylus* ſtigmatibus tribus.

In *Ray's Synopſis*, p. 419. n. 11. there is a ſhort, but very expreſſive deſcription of this plant. In noting however the affinity between this and C. *ſylvatica*, it is alledged that this has either none or very ſhort footſtalks; and other authors have copied this error—It has in fact long footſtalks, but they are concealed within the vagina—This concealment led the old botaniſts to deſcribe it as having none.

It differs from *ſylvatica* by its having its peduncles ſcarcely longer than the vagina, and by its capſules being three-cornered and acute, but not with a long taper roſtrum.

My friend Dr. *John Sibthorp*, the learned *Regius* Profeſſor of Botany in the univerſity of *Oxford*, has lately diſcovered this plant in another ſituation in the neighbourhood of *Oxford*.

22. CAREX PRÆCOX.

C. vaginis brevibus ſubæquantibus, ſpicis approximatis; maſculâ ſubclavatâ; fœmineis ovatis, capſulis ſubrotundis pubeſcentibus. *Buddle, Hort. Sic.* p. 30. n. 6 & 8. *Uvedale, Herb. Rayan.* vol. 12. p. 63. n. 3.

Gramen

Gramen cyperoides ſpicatum, *Gerard. em.* p. 22.

Gramen ſpicatum foliis caryophylleis. *Park.* 1160. *Jacquin Fl. Auſtriac.* 46. *Withering*, 1043.

Carex montana, *Fl. Angl.* 407. *Fl. Scot.* 551.

Habitat in pratis & ericetis. Aprili, Maio.

Radix repens, perennis. *Folia* ſaturatè viridia, tenuia, ad margines carinamque aſpera, culmo breviora. *Culmus* erectus, 6—12 uncialis, triqueter, angulis obtuſiuſculis glabris. *Spicæ* una maſcula, tres fœmineæ, approximatæ propè ſummitatem culmi. Spica maſcula ſemuncialis & ultra, oblonga, ſæpius ſub-clavata, triquetra, erecta, ſquamis membranaceis, ſub-ferrugineis, oblongis, acutis, nervo dorſali viridi. Spicæ fœmineæ ad baſin maſculæ, ovatæ, breviter pedunculatæ, erectæ, floribus denſiuſculè imbricatis; ſquamis ovatis, acutis, capſulas ſubæquantibus. Ad baſin pedunculorum, præſertim inferioris, bractea, ſ. foliolum vaginans, breve, vaginâ brevi, pedunculum brevem æquanti. Hoc foliolum nunquam aut rariſſimè culmum ſuperat. *Capſula* ovata, ſub-triquetra, acutiuſcula, ore indiviſo, tomentoſa, mox nigricans. *Filamenta* ut in cæteris. *Stylus* ſtigmatibus tribus.

This plant is very eaſy to be diſtinguiſhed from the *pilulifera* and *ſaxatilis* of Mr. *Hudſon*, by its having its ſpikes ſhortly pedunculated, and its peduncles encompaſſed by a vagina or ſheath equaling them in length. *Pilulifera* and *ſaxatilis* of Mr. *Hudſon* have no vaginæ. If the vagina be attended to, it will ſoon be diſcovered that no one of the Britiſh ſpecies bears any reſemblance to this. C. *præcox* has a creeping root and an erect ſtalk, with angles ſomewhat ſharpiſh. It is a very common plant, growing on moſt of our heaths and in meadows.

23. CAREX FILIFORMIS. TAB. 20. *fig.* 5.

C. vaginis brevibus ſubæquantibus, ſpicis maſculis ſub-duabus linearibus; fœmineis ovatis remotis, capſulis hirtis.

Cyperoides ſylvaticum anguſtifolium, ſpicis parvis tenuibus ſpadiceo-viridibus. *Scheuchzer*, 425. t. 10. f. 11. *Fl. Suecica*, n. 847.

Carex tomentoſa, *Fl. Scot.* p. 553.

Habitat propè *Eaton*, in com. *Salop.* Rev. *E. Williams.*
At the ſouth end of *Air Links.* Dr. *Hope.* Junio.

Radix repens, perennis. *Folia* tenuiora, erecta, in apicem tenuiſſimum deſinentia, marginibus carinâque aſperiuſcula 1—3 pedalia. *Culmus* erectus, tenuis, triqueter, angulis acutis hiſpidis, foliis ſubæqualis. *Spicæ* ſæpiùs duæ maſculæ, totidem fœmineæ—Maſcula ſuperior 1½—2 uncialis; inferior vix uncialis; ambæ lineares; ſ. filiformes, erectæ, ſquamis oblongis, acutis, nigro-ferrugineis, nervo dorſali viridi. Spicæ fœmineæ ſæpiùs duæ (aliquando unica tantum ſeſe protrudit), ovatæ, erectæ, breviſſimè pedunculatæ diſtantes.—Ad baſin pedunculorum bractea, ſ. folium vaginans, vaginâ perbrevi, pedunculum perbrevem omnino fere amplectenti—Vagina in foliolum abit culmo paulò brevius—Squamæ ut in ſpicâ maſculâ, capſulas ſubæquantes. *Capſula* hirta, ſive lanato-villoſa, ſub-triquetra, oblongiuſcula, ore hiante furcato.—*Filamenta* tria. *Stylus* ſtigmatibus tribus, villoſis, craſſiuſculis.

Obſ. Spica fœminea ſuperior ſæpè ſeſſilis.

Anxious to determine this ſpecies, I ſolicited the honour of being permitted to conſult Mr. *Lightfoot*'s herbarium, which is now,

as

as I have before obſerved, in her MAJESTY's poſſeſſion.—I am therefore enabled to pronounce, that this plant is Mr. *Lightfoot*'s *Carex tomentoſa.*

It is readily diſtinguiſhed from all *Carices* in its very foliage. Its leaves are narrow, very long, oftentimes a yard; and they end in a long and very taper point, ſomething like the American *Dactylis cynoſuroides.* In fructification it is equally diſtinct, by having generally two male ſpikes and never more, and capſules downy, almoſt woolly. This is in the Linnean herbarium with the name *filiformis* inſcribed by *Linnæus* himſelf, therefore we can have no doubt about its identity. It is ſomewhat ſurpriſing that *Linnæus* never mentioned the downineſs of the capſules—This omiſſion naturally led Mr. *Lightfoot*, who otherwiſe ſuſpected it to be *Linnæus*'s *filiformis*, to call it *tomentoſa.*

The narrowneſs of the foliage being ſo remarkable, I wonder that *Linnæus* did not take the hint from *Scheuchzer*, and name it *C. tenuifolia.*

I am much indebted to the Rev. Mr. *Williams* of *Eaton*, near *Shrewſbury*, for roots and ſpecimens of this plant. I received roots alſo from my friend Dr. *Sibthorp* of *Oxford*, who was likewiſe indebted to Mr. *Williams* for them. Cultivated in a garden, it never, or rarely flowers.

24. CAREX FLAVA.

C. vaginis brevibus ſub-æquantibus foliolo divaricato, ſpicâ maſculâ lineari; fœmineis ſubrotundis, capſulis roſtrato-acuminatis. *Buddle, Hort. Sic.* p. 30. n. 11.

Gramen cyperoides aculeatum Germanicum. *Mor. Hiſt. Ox.* III. 243. ſ. 8. t. 12. f. 19.

Gramen

Gramen paluſtre echinatum. *Ger.* 17. *Park.* 1187. *Fl. Suecica*, n. 843. *Leers*, t. 15. f. 6. *Fl. Dan.* 1047. *Fl. Angl.* 407. *Fl. Scot.* 551. *Withering*, 1037.

Habitat in paludoſis paſſim. Maio, Junio.

Radix repens, perennis. *Folia* amœnè viridia, ad margines carinamque aſperiuſcula, culmo longiora. *Culmus* erectus, triqueter, angulis acutis, glabris, altitudine varius, uncialis, pedalis, & ultra. *Spicæ* una maſcula, tres fœmineæ—Spica maſcula terminalis, ſublinearis, erecta, ſemuncialis-uncialis, ſub-triquetra; ſquamis ovato-oblongis, obtuſiuſculis, fulvis, nervo dorſali viridi. Spicæ fœmineæ modo omnes ad ſummitatem culmi congeſtæ; modo inferior remota, cæteris propè maſculam congeſtis, modo, quod ſæpe accidit, omnes a ſe invicem remotæ, ſubrotundæ, ſed variant & præſertim inferior, oblongæ, pedunculo vaginâ ſuâ paulò longiori. Squamæ fere ut in maſculâ, capſulâ breviores—Ad baſin omnis pedunculi bractea, ſ. folium vaginans, vaginâ pedunculi longitudine. Veruntamen eſt ubi pedunculus inferior, præcipuè cum remotus ſit, vaginam ſuam fere dimidio ſuperat. Vagina in foliolum abit, culmo longius, divaricatum. *Capſula* ſub-triquetra, ovata, roſtrata, roſtro ſæpe ſub-reflexo, ore plerumque indiviſo, & ad baſin ſpicæ, ex rotunditate ſ. contractione receptaculi, deorſum ſpectans. *Filamenta* ut in cæteris. *Stylus* ſtigmatibus tribus.

Obſ Variat ſed rariùs ſpicis maſculis duabus, tum culmi angulis aſperiuſculis.

The long divaricated foliaceous bractea is a very conſtant diſcriminating mark in this ſpecies: this, together with its round prickly heads, render the inveſtigation perfectly eaſy.

It

It may however be difficult to keep it always diſtinct from the two following, which have been conſidered as varieties of it. The capſule is a good guide to diſtinguiſh it from C. *extenſa*, being in C. *flava* oblong, with a long taper point, and in C. *extenſa* ovate and acute. But the capſule is no guide in its ſeparation from C. *fulva*, being apparently the ſame. C. *flava* has always three female ſpikes, and C. *fulva* as conſtantly two—Then C. *flava* has its bracteæ divaricated; C. *fulva* upright, particularly the loweſt. The diviſion of the apex of the capſule has always appeared to me conſtant in C. *fulva*, but is by no means ſo in C. *flava*. The habit of theſe two plants ſeems very different. And the female ſpikes in C. *fulva* are always acute, and never round.

25. CAREX EXTENSA. Tab. 21. *fig.* 7.

C. vaginis breviſſimis æquantibus foliolo ſub-reflexo, ſpicis confertis; fœmineis ſub-rotundis, capſulis ovatis acutis.
Buddle, Hort. Sic. p. 30. n. 10.

Carex flava, *Var.* β. *Hudſ. Flora Anglica*, p. 407.

Habitat in paluſtribus, propè Harwich—On the marſhy part of Braunton Burrows in Devonſhire. Junio.

Radix ——— perennis. *Folia* radicalia ſub-anguſta, culmo breviora (quæ autem culmi baſin amplectuntur, eundem ſæpe æquant, ſæpe ſuperant) ſummitatem versus marginibus carinâque aſperiuſculis. *Culmus* erectus, pedalis & ultra, triqueter, angulis obtuſiuſculis, glabris. *Spicæ* una (rarius duæ) maſcula; duæ, ſæpe tres, fœmineæ. Spica maſcula linearis, ſemuncialis & ultra (ſi duæ adſint altera quintuplo brevior) terminalis; ſquamis fuſcis, nervo dorſali viridi, oblongis, ſub-obtuſis. Spicæ fœmineæ ſæpiùs ad baſin

baſin maſculæ, confertiuſculæ; aliquando autem inferior remotiuſcula, ovata (ſuperiores ſub-conicæ), acutiuſcula; omnes plerumque breviter pedunculatæ; ſquamis ovatis, fuſcis, nervo dorſali craſſiuſculo, qui in mucronem prominulum deſinit, capſulâ demum duplo brevioribus. Ad baſin ſpicarum fœminearum bractea foliacea, quæ vaginâ ſuâ pedunculum totum, qui quidem omnino brevis eſt, amplectitur: inferior longiſſima, & culmum longiſſimè ſuperat: ſuperiores breviores; interdum ſuperior culmo brevior. Omnes denique reflexæ. *Capſulæ* glabræ, patentes, ſub-trigonæ, nervoſæ, ovatæ, acutæ, apice in denticulos duos diviſo, roſtro (ſi roſtrum fas ſit dicere) breviſſimo. *Filamenta* tria. *Stylus* ſtigmatibus tribus.

This plant has always, I believe, paſſed as a variety of *Carex flava*. However, the fructification proves it to be entirely diſtinct.

In C. *extenſa* the leaves are narrower than in C. *flava*, and the whole plant is ſlenderer and taller. The ſquamæ of the female ſpikes are ovate and bluntiſh, with the nerve ending in a very ſhort projecting point, and are ſhorter in proportion to the capſule than in C. *flava*. The capſules are rather acuminated, but by no means roſtrated or beaked, and the ſummit is ſlightly bifid. The bracteæ are uſually reflexed. The female ſpikes have their peduncles only of the length of the vagina, and not longer. The capſules alſo are patent, but very rarely divaricated. This plant does not owe its height to being drawn up by the ſurrounding herbage, for I have always found it in open places.

I have found it in the marſhy ground near *Harwich*, and in the marſhy ground on the weſt ſide of *Braunton Burrows*, in the north of Devonſhire. It is not a common plant.

Obſ. The circumſtance of the ſpikes being cluſtered together is very conſtant in this ſpecies, but it is by no means ſo in C. *flava*.

26. CAREX FULVA. Tab. 20. *fig.* 6.

C. vaginâ infimâ ſubdimidiatâ; ſuperioribus ſubæquantibus, ſpicis fœmineis duabus oblongis acutis, capſulis roſtrato-acuminatis.

Carex diſtans. *Fl. Dan.* t. 1049.

Habitat propè Eaton, juxta Shrewſbury, in agro Salopienſi. Rev. *E. Williams.* Junio, Julio.

Radix repens, perennis. *Folia* erecta, anguſta, marginibus cariâque aſperis, culmo breviora. *Culmus* erectus, tenuis, ſub-pedalis, triqueter, angulis acutis, aſperis. *Spicæ*, una maſcula, duæ plerumque fœmineæ. Spica maſcula terminalis, ſub-linearis, ſemuncialis & ultra, acutiuſcula; ſquamis flaveſcentibus, margine albo, oblongis, modo obtuſis, modo obtuſiuſculis. Spicæ fœmineæ ſæpius remotæ, ovato-oblongæ, acutæ, inferior pedunculata, pedunculo longiuſculo, ſuperior ſubſeſſilis; ſquamis oblongis, acutis, ſæpe acutiuſculis, capſulam fere æquantibus. Ad baſin omnis ſpicæ fœmineæ bractea ſ. folium vaginans; inferior erecta, culmum plerumque æquans, vaginâ pluſquam dimidium pedunculi amplectente; ſuperior ſub-divaricata, culmo plerumque brevior, pedunculum, qui profecto breviſſimus eſt, totum fere vaginâ occupans—interdum totum occupat. *Capſulæ* ſub-trigonæ, nervis ſtriatæ, oblongæ, roſtrato-acuminatæ, ſquamas ſub-æquantes, ſæpe excedentes, apice diviſo, patentes, nec divaricatæ, aut deorſum ſpectantes.—*Filamenta* tria—*Stylus* ſtigmatibus tribus.

Obſ. Variat, ſed rarius, ſpicis fœmineis tribus.

This plant is ſcarcely removed from *C. flava.* However, it differs from it in having the angles of the culm ſharp and rough. The female ſpikes are remote, oblong and acute, not round; the lowermoſt is ſupported by a long footſtalk, half of which nearly

appears above the vagina. Beſides, it has ſcarcely ever more than two female ſpikes. The lowermoſt bractea is erect, and not divaricated. The capſules are not divaricated, but patent, and are ſlightly divided at the ſummit. I regret that I have had no opportunity of cultivating it.

I am indebted to the *Reverend Mr. Williams* of *Eaton* near *Shrewſbury* for my knowledge of this plant as a native of Britain—I have received it from *America* and *Newfoundland*, but never underſtood till very lately that it was an inhabitant of our country.

27. CAREX DISTANS.

C. vaginâ infimâ ferè dimidiatâ; ſuperioribus ſubæquantibus, ſpicis oblongis remotiſſimis, capſulis acutis.

Buddle, Hort. Sic. p. 29. f. 5.

Uvedale, Herb. Rayan. vol. 12. p. 66. n. 1.

Gramen cyperoides paluſtre, ſpicis tribus ſubrotundis vix aculeatis, ſpatio diſtantibus. *Mor. Hiſt. Ox.* 243. ſ. 8. t. 12. f. 18.

Carex ſpicis parvis longe diſtantibus. *Scheuchzer*, 431. *Withering*, 1049. *Fl. Angl.* 412. *Fl. Scot.* 561. *Fl. Dan.* 1049.

Carex panicea, *Fl. Suecica*, Var. α?

Habitat in paluſtribus, præcipuè maritimis. Junio.

Radix fibroſa, perennis. *Folia* pallidè vireſcentia, marginibus carinâque aſperiuſculis, culmum floriferum ſub-æquantia. *Culmus* erectus, triqueter, angulis acutis, glabris, pedalis, bipedalis. *Spicæ*, una maſcula, rarius duæ; tres fœmineæ. Spica maſcula terminalis erecta, ſub-linearis, flaveſcens, quandoque nigricans, uncialis & ultra; ſquamis ſub-flaveſcentibus, nervo dorſali viridi, marginibus albis, obtuſis. Spicæ fœmineæ oblongæ, unciales & ultra, erectæ,

erectæ, pedunculatæ, valdè remotæ; ſquamis acutiuſculis, capſulâ brevioribus. Ad baſin omnis pedunculi bractea ſ. folium vaginans. Vagina inferior non pedunculi longitudine, tamen pluſquam dimidium occupat; ſuperiores pedunculos ſuos æquant. Vaginæ in foliola abeunt ſpicis ſuis multoties longiora, at culmo breviora—*Capſulæ* ſub-triquetræ, ovatæ, acuminatæ, ore ſub-diviſo. *Filamenta* ut in cæteris—*Stylus* ſtigmatibus tribus.

The remarkable diſtance at which the female ſpikes are placed from each other, is a diſtinction too obvious to admit of any doubt. *C. hirta* has them ſituated in the ſame manner; but the leaves are hairy, and the capſules villous, in that ſpecies—in *C. diſtans* they are both perfectly ſmooth.

It uſually flowers in May and June.

28. CAREX PANICEA.

C. vaginâ infimâ ſubdimidiatâ; ſuperioribus ſub-æquantibus; ſpicis erectis remotis, capſulis inflatis obtuſiuſculis ſub-diſtantibus.

Uvedale, Herb. Rayan. vol. 12. p. 62. n. 1.

Cyperoides foliis caryophylleis (caule rotundo-triquetro), ſpicis e rarioribus & tumidioribus veſicis compoſitis. *Mich. Gen.* t. 32. f. 11.

Fl. Suecica, 853, Var. β.

Leers, t. 15. f. 5. *Fl. Dan.* 261. *mala. Fl. Scot.* 558. *Withering*, 1044.

Habitat in pratis & paſcuis humidis. Maio, Junio.

Radix repens, perennis. *Folia* glauca, marginibus carinâque aſperiuſculis, culmo breviora. *Culmus* erectus, triqueter, angulis acutiuſculis, glabris, ſub-pedalis. *Spicæ*, una (rarius duæ) maſcula,

circiter tres fœmineæ. Spica maſcula terminalis, oblonga, uncialis; ſquamis fulvis, oblongo-ovatis, acutiuſculis. Spicæ fœmineæ omnes a ſe invicem remotæ, ovatæ, erectæ, pedunculatæ, floribus laxè imbricatis, ſquamis oblongo-ovatis acutis, capſulâ brevioribus, nervo dorſali viridi.—Ad baſin ſinguli pedunculi bractea ſ. folium vaginans, vaginâ inferiori circiter dimidium, aut paulo plus, pedunculi amplectente; cæteris pedunculos ſuos fere æquantibus. Hæ bracteæ in foliola deſinunt culmo breviora, ſpicis ſuis longiora. *Capſula* pallida, ſubovata, baſi compreſſiuſcula, ſupernè inflata, obtuſiuſcula, ore clauſo, indiviſo. *Filamenta* ut in cæteris.—*Stylus* ſtigmatibus tribus.

C. panicea, in its younger ſtate, is very like the young ſpecimens of *C. recurva*; but it is at once diſtinguiſhed by the vagina.—In *panicea* the lowermoſt vagina is full half the length of the footſtalk, in *recurva* about one quarter only. It is diſtinguiſhable alſo by its alternate diſtant capſules; in *recurva* they are crowded in a thicker ſpike.

29. CAREX CAPILLARIS.

C. vaginis dimidiatis, ſpicis fœmineis oblongis laxis: fructiferis-pendulis, pedunculis capillaribus, capſulis acuminatis.

Fl. Scot. p. 557. *Fl. Dan.* t. 168. *Scop. Fl. Carniol.* 1152. t. 59.

Habitat in montoſis Scoticis.

Radix fibroſa, perennis—*Folia* tenuiſſima, culmo fere triplo breviora. *Culmus* erectus, triqueter, angulis obtuſiuſculis, glabris, 2—5 uncialis. *Spicæ*, una maſcula, duæ fœmineæ, omnes ad ſummitatem

tatem culmi. Maſcula erecta, oblonga, ſ. ſub-linearis, flaveſcens; ſquamæ oblongæ, acutiuſculæ. Fœmineæ ambæ ex eodem nodo prodeunt, pedunculatæ, mox pendulæ, oblongæ, paucifloræ—Bractea ſ. folium vaginans dimidium pedunculorum, qui capillares ſunt, occupat. Vagina in foliolum exit culmo paulum longius. Squamæ deciduæ, ovatæ, obtuſæ, ſub-fulvæ, capſulâ breviores. *Capſula* ovata, roſtrato-acuminata, ore indiviſo. *Stigmata* tria.

Obſ. Spica maſcula admodum pauciflora.

The diminutive ſtature of this plant, its capillary peduncles, its female ſpikes pendulous, lax, with few flowers, from four to eight, and the ſquamæ of the ſame being *deciduous*, place it in too *conſpicuous* a light to be miſtaken.

I never have had the good fortune to ſee this plant growing; I have therefore been obliged to take my deſcription from dried ſpecimens.

30. CAREX DEPAUPERATA.

C. vaginis pluſquam dimidiatis, ſpicis fœmineis remotis pauciſloris, capſulis ovatis inflatis roſtrato-acuminatis.

Cyperoides ſylvarum anguſtifolium caule trilatero, ſpicis parvis, capſulis rarius diſpoſitis, obeſis, &c. *Mich. Gen.* p. 56. t. 32. f. 5. *Withering*, p. 1049.

Carex ventricoſa. *Fl. Londin. bona.*

Habitat in ſylvâ *Charlton* dictâ—In ſylvis propè *Godalmin* in agro Surreiano. Maio, Junio.

Radix fibroſa, perennis. *Folia* pallidè vireſcentia, marginibus carinâque aſperis; radicalia ad baſin rufa, culmo breviora. *Culmus* erectus, pedalis, bipedalis, triqueter, angulis obtuſiuſculis, glabris.

Spicæ,

Spicæ, una maſcula, terminalis, linearis, ſquamis flaveſcentibus, nervo dorſali viridi, ovato-oblongis, acutiuſculis. Spicæ fœmineæ remotæ, longè pedunculatæ, erectæ, paucifloræ—quæque ſcilicet ſpica circiter 3—6 flores gerit. Flores laxè diſpoſiti. Squamæ flaveſcentes, nervo dorſali viridi (qui nervus in mucronem deſinit), oblongo-ovatæ, acutæ, capſulâ fere dimidio breviores. Ad baſin omnis pedunculi bractea ſ. folium vaginans, quod circiter tertiam partem pedunculi, nec dimidium, amplectitur. Vagina in foliolum abit ſæpiſſimè culmo longius. *Capſula* oblongo-ovata, inflata, ſub-triquetra, erecta, roſtrata, ore indiviſo. *Filamenta* tria, antheris linearibus flavis. *Stylus* ſtigmatibus tribus.

Obſ. Capſulæ ſæpius bifariàm imbricatæ.

I do not heſitate to adduce the ſynonym and figure of *Michelius*. It certainly belongs to this plant, as any one may ſatisfy himſelf who will take the trouble to obſerve how accurately the vaginæ are repreſented. In the *veſicaria*, to which it has been applied, there are no vaginæ—In this they embrace almoſt half of the peduncle or footſtalk. *Michelius*'s figure plainly conveys this idea.

Its diſtant long-pedunculated ſpikes, and few capſules, readily diſtinguiſh this ſpecies from all others. This laſt circumſtance induced the late Dr. *Solander* to name it in his MSS. *C. depauperata*, whom Dr. *Withering* firſt followed.

Mr. *Curtis* has given us an excellent figure of it under the name of *Carex ventricoſa*.

I had the good fortune to find this ſpecies in *Charlton* wood—Mr. *Dickſon* has told me that it is not unfrequent in dry woods near *Godalmin* in *Surrey*. I apprehend, from the form of the capſule, that it has been taken for a ſtarved variety of *C. veſicaria*; as I cannot

I cannot think it poſſible that a plant of this ſize, in the neighbourhood of London, could have eſcaped ſo long unnoticed. Probably the vagina was never attended to.

31. CAREX SYLVATICA.

C. vaginis abbreviatis, ſpicis filiformibus laxis pendulis, capſulis ovatis ariſtato-roſtratis.

Buddle, Hort. Sic. p. 29. n. 4.
Uvedale, Herb. Rayan. vol. 12. p. 67. n. 1.
p. 69. n. 1.
p. 73. n. 1.

Gramen cyperoides ſylvarum tenuius ſpicatum.
Moriſ. Hiſt. Oxon. III. 243. ſ. 8. t. 12. f. 9.
Park. 1172. *Scheuchzer*, 418.
Leers, 15. 2. *Withering*, 1047. *Fl. Dan.* 404. *Fl. Angl.* 411.
Fl. Scot. 562.

Carex patula. *Pollich.* n. 896.

Habitat in ſylvis paſſim. Maio, Junio.

Radix fibroſa, perennis. *Folia* pallidè virescentia, ad margines carinamque ſupernè hiſpida, culmo breviora. *Culmus* bipedalis & ultra, erectus, triqueter, angulis ſupernè obtuſiuſculis, glabris. *Spicæ*, una (rarius duæ) maſcula, circiter ſex fœmineæ, omnes a ſe invicem remotæ. Spica maſcula terminalis, erecta, linearis, triquetra, uncialis, biuncialis, atque etiam ultra. Squamæ flaveſcentes, baſi albâ, nervo dorſali viridi, oblongæ, acutæ. Spicæ fœmineæ longius pedunculatæ, citò pendulæ, filiformes, floribus laxè imbricatis. Squamæ flaveſcentes, nervo dorſali viridi, ovatæ, acuminatæ, capſulâ breviores. Ad baſin omnis pedunculi bractea ſ. folium vaginans,

vaginans, cujus vagina circiter quartam partem pedunculi amplectitur. Vagina in folium abit ſuâ ſpicâ paulò longius. *Capſula* ovata, acuminata, roſtrata, roſtro tenui, ore indiviſo. *Filamenta* ut in cæteris.—*Stylus* ſtigmatibus tribus.

None of the figures of this plant, except that of *Leers*, give its due character. The figures of *Moriſon*, *Parkinſon*, and *Fl. Danica*, repreſent it in its firſt ſtage of flowering when the ſpikes are erect. It does not long continue in this attitude; for the ſpikes, by reaſon of their thin and long footſtalks, as ſoon as the impregnation of their flowers has taken place, are too heavy for their weak ſupporters. It uſually produces five or ſix female ſpikes, and one male, very rarely two.

Every one muſt be ſurpriſed at *Linnæus*'s joining this as a variety to *veſicaria* and *ampullacea*.

32. CAREX RECURVA.

C. vaginis abbreviatis, ſpicis fœmineis ſub-cylindricis pendulis, capſulis rotundato-ovatis, radice repente.
Buddle, Hort. Sic. p. 30. n. 3. 4.

Gramen nemoroſum ſpicâ ſubnigrâ recurvâ. *Moriſ. Hiſt. Ox.* ſ. 8. t. 12. f. 14.

Carex limoſa. *Leers, Var.* β. t. 15. f. 3. *Fl. Angl.* p. 413. *Withering*, 1050. *Fl. Dan.* 1051.

Habitat in pratis, paſcuis, nemoribus & ericetis. Maio, Junio.

Radix repens, perennis. *Folia* glauca, pro magnitudine plantæ latiuſcula, marginibus carinâque aſperrima. *Culmus* erectus, triqueter, angulis acutiuſculis, glabriuſculis, foliis radicalibus longior, pedalis. *Spicæ*, una (ſæpè duæ, rarò tres) maſcula, tres fœmineæ.

Spica maſcula terminalis, oblonga, ſub-cylindrica, plus minuſve uncialis, ſquamis nigro-ferrugineis, oblongis, obtuſis, nervo dorſali viridi, margine membranaceo albo. Spicæ fœmineæ ſub-cylindricæ, unciales, ſeſcunciales, longiùs pedunculatæ, primùm erectæ, mox maturiores pendulæ, remotæ. Ad baſin pedunculorum bractea, vaginâ abbreviatâ, ſ. vix quartam partem pedunculi amplectente, utrinque baſi auriculata, auriculâ ſub-rotundâ. Vagina in folium deſinit culmo ſæpè longius. Squamæ oblongæ, acutæ, capſulâ paulo breviores. *Capſula* ovata, ſub-triquetra, obtuſiuſcula, ore clauſo, primùm viridis, inde gradatim flaveſcens, ferruginea, nigra, ſub lente ſub-tomentoſa. *Filamenta* tria. *Stylus* ſtigmatibus tribus, craſſiuſculis, villoſis.

Although no *Carex* can be ſaid to vary more in ſize and habit than this, yet, to an attentive obſerver, there will be no difficulty in determining it. Its cylindrical pendulous black ſpikes, its glaucous leaves, ſhort vaginæ, roundiſh capſules, ſmooth culm, and creeping root, are obvious diſtinctions.

It ſeems ſtrange that ſo common a Carex as this is ſhould have been ſo little noticed by the old authors. I recollect no old figure of it beſide *Moriſon*'s—that indeed characteriſes it ſufficiently. *Leers*'s figure is tolerable; he ſeems to have joined *C. limoſa* his Var. *α*, and *recurva* his Var. *β*. in one—which is a confuſion very unuſual to his general conſummate accuracy.

I ſhould almoſt have apprehended that Mr. *Lightfoot* had intended this plant by his *C. caſpitoſa*, Var. *α*. had he not expreſsly mentioned that it had only two ſtigmata—whereas this invariably has three, and protrudes them in a manner not eaſy to be miſtaken, being thicker, longer, and more villous than in the generality of this family.

33. CAREX PALLESCENS.

C. vaginis abbreviatiſſimis, ſpicis fœmineis ſub-cylindricis: fructiferis pendulis, capſulis oblongis obtuſis.
Buddle, Hort. Sic. p. 30. n. 5.
Gramen cyperoides polyſtachion flavicans, ſpicis brevibus propè ſummitatem caulis. *Mich. Gen.* 61. t. 32. f. 13. *Pluk.* t. 34. f. 5.
Sp. Pl. 1386. *Fl. Suecica*, n. 852. *Leers*, t. 15. f. 4. *Fl. Angl.* 410. *Withering*, p. 1043. *Pollich.* n. 889. *Fl. Scot.* 558. *Fl. Dan.* 1050.

Habitat in ſylvis, pratis, & paſcuis humidis. Maio, Junio.

Radix fibroſa, perennis. *Folia* anguſta, pallida, ad margines carinaſque ſcabriuſcula, culmo dimidio breviora, piloſa. *Culmus* erectus, pedalis, ſeſquipedalis, triqueter, angulis ſupernè acutiſſimis, infernè obtuſiuſculis, aſperis. *Spicæ*, una maſcula, tres fœmineæ, omnes ad ſummitatem culmi approximatæ. Spica maſcula terminalis, oblonga, triquetra, ſemuncialis; ſquamis flaveſcentibus, nervo dorſali viridi, acutiuſculis. Spicæ fœmineæ ſub-cylindricæ, obtuſæ, pedunculatæ, mox pendulæ; ſquamis ovatis, acutis, capſulâ paulò brevioribus. Ad baſin pedunculorum bractea, quæ culmum longè ſuperat, vaginâ breviſſimâ, ne quidem octavam pedunculi partem amplectenti. Flores densè imbricati. *Capſula* pallida, viridis, oblonga, obtuſa, ore integro.—*Filamenta & antheræ* ut in cæteris.—*Stylus* ſtigmatibus tribus.

None of the figures give a good repreſentation of the female ſpikes in their mature ſtate—at that time they are nearly cylindrical, whereas in the figures here quoted we have only the ovate form, in which they appear when firſt in flower.

34. CAREX LIMOSA.

C. vaginis abbreviatiſſimis ſub-nullis, ſpicis fœmineis ovatis pendulis, capſulis ovatis compreſſis, radice repenti.

Cyperoides ſpicâ pendulâ breviore, ſquamis e ſpadiceo vel fuſco rutilante viridibus. *Scheuchzer*, 443. t. 10. f. 13.
Flor. Suecic. n. 850. *Fl. Angl.* 409. *Withering*, 1041. *Pollich.* n. 888. *Fl. Dan.* 646.

Habitat in paludibus turfoſis, in comitatibus Eboracenſi, Lancaſtrienſi, Weſtmorelandico, &c. paſſim. Junio.

Radix repens, perennis. *Folia* glauca, erecta, tenuia, marginibus carinâque aſpera. *Culmus* erectus, triqueter, angulis acutis, aſperiuſculis. *Spicæ*, una maſcula, duæ fœmineæ. Spica maſcula terminalis, oblonga, ſub-linearis; ſquamis flaveſcentibus ſ. ſubferrugineis, oblongis, acutis. Spicæ fœmineæ longiùs pedunculatæ, mox pendulæ, ovatæ, acutiuſculæ; ſquamis ovatis, acutis, ſæpe mucronatis, fuſcis, nervo dorſali viridi, capſulâ paulo longioribus. Ad baſin pedunculorum bractea culmo longior, quæ vix ac ne vix quidem ullam partem pedunculi complectitur. *Capſula* ſub-compreſſa, nervoſa, ovata, mucronata, ore integro. *Filamenta* ut in cæteris. *Stylus* ſtigmatibus tribus.

This plant has been confounded with *recurva*, from which it is readily diſtinguiſhable by its very ſhort vaginæ, by its ovate ſpikes, and by the ſhape and colour of its capſules, which are compreſſed; of a cæſious green colour when young, and brown when ripe; not round, ovate, and black as in *recurva*.

Upon cultivating it, I obſerved, that it frequently threw up barren leafy ſtalks; upon cutting theſe off, and planting them in

pots plunged in water, they readily took root, and formed luxuriant plants. The name *ſtolonifera* would have been peculiarly proper for it.

This ſpecies, when cultivated in a garden, rarely flowers. In a wild ſtate I have never ſeen it with more than *two* female ſpikes, uſually with *one* only.

35. CAREX PSEUDO-CYPERUS.

C. vaginis ſub-nullis, ſpicis fœmineis cylindricis pedunculatis pendulis, capſulis ariſtato-roſtratis ſub-divaricatis.
Uvedale, Herb. Rayan. vol. 12. p. 65. C.

Pſeudo-cyperus, *Ger. em.* 29. *Park.* 1266.

Gramen cyperoides ſpicâ pendulâ breviori. *Mor. Hiſt. Ox.* III. 242. ſ. 8. t. 12. f. 5.
Fl. Suecica. 854. *Fl. Angl.* 410.
Fl. Scot. 559. *Pollich.* n. 891. *Withering*, 1045.

Habitat in nemoroſis humidis, & ad ripas foſſarum. Junio.

Radix fibroſa, perennis. *Folia* pallidè viridia, lata, canaliculata, marginibus carinâque aſperis, culmo ferè duplo longiora, omnia longitudine ferè æqualia. *Culmus* pedalis & ultra, ad ſummum ferè folioſus, erectus, triqueter, angulis acutis, aſperis. *Spicæ*, una maſcula, quatuor fœmineæ; omnes lineares, tenues, pallidæ. Spica maſcula terminalis, ſub-triquetra, bracteata, bracteâ ſetaceâ, ſpicâ dimidio breviori; ſquamis ſub-ſetaceis, pallidis, nervo dorſali viridi, ad apicem marginibus carinâque hiſpidis. Spicæ fœmineæ pedunculatæ, pedunculo ſpicâ ſuâ longiori, teretes, fructiferæ pendulæ; intermediæ geminatæ, cæteræ ſolitariæ; ſquamæ ut in ſpicâ maſculâ, capſulas ſub-æquantes. Ad omnem ſpicam fœmineam brac-

tea foliacea, inferior *culmum longè* ſuperans, cæteræ etiam culmum ſuperantes; omnes ſubſeſſiles, aut baſin pedunculi, breviſſimè quidem, amplectentes. *Capſulæ* oblongæ, ſtriatæ, medio ſub-ventricoſæ, roſtratæ, roſtro longo, tenui, apice diviſo, ſ. ſub-furcato, ſubdivaricatæ.—*Filamenta* tria.—*Stylus* ſtigmatibus tribus, albis.

Linnæus took his character of this plant from its having two *peduncles* riſing from each joint of the *culm*. However, that is ſo very uncertain a mark, that it is not poſſible to place any dependance upon it. The circumſtance of its having no vaginæ, or at beſt very minute ones, and *capſules* nearly divaricated, and ending in a long point, repreſents it in a ſufficiently-diſtinguiſhable light. The intermediate *peduncles* are not unfrequently found doubled.

36. CAREX ATRATA.

C. vaginis ſub-nullis, ſpicis omnibus androgynis terminalibus pedunculatis: fructiferis pendulis, capſulis ovatis acutiuſculis.

Cyperoides Alpinum pulchrum foliis caryophylleis, ſpicis atris & tumentibus.

Scheuchzer, p. 481. t. 11. f. 1. 2.

Fl. Suecica, 849. *Fl. Anglica*, 409. *Fl. Dan.* 158.

Fl. Scot. 555. *Withering*, 1040.

Habitat in montibus Cambro-Britannicis & Scoticis. Maio, Junio, Julio.

Radix fibroſa, perennis. *Folia* lata, culmo breviora, carinata, marginibus carinâque aſperis. *Culmus* erectus, triqueter, angulis acutis aſperiuſculis, pedalis. *Spicæ* non ſexu diſtinctæ, quippe ſumma non maſcula, at plerumque fœminea, & ad baſin flores maſculos gerit, nec non quoſdam hermaphroditicos ſparſos, quod etiam

etiam in cæteris quandoque accidit. Spicæ omnes oblongæ, acutæ, ſemunciales, pedunculatæ, pedunculo longo, demùm pendulæ, approximatæ. Squamæ ovatæ, acutæ, nigræ, nervo tenuiori dorſali, viridi, capſulâ paulò longiores. Ad omnem pedunculum bracteа foliacea; infima culmo plerumque longior, ſed variat brevior, ſubſeſſilis: eſt ubi inferior baſin pedunculi, at breviſſimè, amplectitur. *Capſula* viridis, ovata, ſæpe acuta, compreſſa, apice breviter diviſo. *Filamenta* duo, antheris linearibus flavis. *Stylus* ſtigmatibus tribus, villoſis.

This ſpecies with us has all its ſpikes androgynous; in ſtrict juſtice, therefore, it ſhould be arranged under the order *Spicis androgynis*. But there is ſomething in its habit ſo perfectly conformable to thoſe ſtyled *Spicis ſexu diſtinctis*, that rigid rule muſt give way:—the ſingularity in this ſpecies is, that it has for the moſt part only two ſtamina, and a few hermaphrodite flowers.

Its having no vaginæ, or at leaſt very minute ones, and black ovate ſpikes, are marks ſufficient to diſtinguiſh it readily from all others with which it can come in any competition.

The ſpecimen in the *Linnean herbarium* ſeems to be the ſame as our Engliſh plant; but that has its terminal ſpike evidently male.

Scheuchzer's figure gives no bad repreſentation of the hermaphrodite flower.

37. CAREX PILULIFERA.

C. vaginis nullis, ſpicâ maſculâ ſub-lineari, fœmineis ſubrotundis ſeſſilibus confertis, culmo debili.

Buddle Hort. Sic. p. 30. n. 9.

Gramen cyperoides tenuifolium, ſpicis ad ſummum caulem ſeſſilibus globulorum æmulis. *Pluk. ph.* t. 91. f. 8.

Mor. Hiſt. Ox. III. 243. ſ. 8. t. 12. f. 16.

C. mon-

C. montana. *Fl. Suecica*, n. 845. *Leers*, t. 16. f. 6.
C. pilulifera. *Sp. Pl.* 1385. *Fl. Angl.* 408. *Fl. Scot.* 554.
Withering, 1039. *Fl. Dan.* 1048.

Habitat in paſcuis & ericetis humidis paſſim. Aprili, Maio.

Radix fibroſa, perennis. *Folia* ex flaveſcenti amœnè viridia, tenuia, culmo breviora, marginibus carinâque apicem verſus hiſpida. *Culmus* debilis, incurvus, ſæpiùs recumbens, triqueter, angulis acutis ſub-lævibus, 3—6 uncialis, & ultra. *Spicæ*, una maſcula, & circiter tres fœmineæ. Spica maſcula terminalis, linearis, aliquando oblongiuſcula, tenuis; ſquamis oblongo-ovatis, acutis, fuſcis, nervo dorſali viridi, margine tenero albido. Fœmineæ tres, ad baſin maſculæ, approximatæ, oblongæ, acutæ, maturiores ſubrotundæ; duæ inferiores bracteâ brevi, foliaceâ, ſeſſili, ſubtenduntur; ſuperior bracteâ membranaceâ, ovatâ, carinatâ, quæ denuò in mucronem foliaceum deſinit; ſquamæ fere ut in maſculâ ſed pallidiores, capſulam maturam ſubæquantes. *Capſula* mox nigricans, ſubrotunda, ſub-tomentoſa, mucronata, mucrone brevi obtuſiuſculo, apice indiviſo. *Filamenta* ut in cæteris. *Stylus* ſtigmatibus tribus.

Obſ. In ſpicis fœmineis, flores terminales plerumque maſculi. Poſt breve tempus hi decidui ſunt, unde ſpicæ ſæpiùs rotundæ evadunt. Spica inferior variat, ſed rarius, breviter pedunculata.

I own that I ſtill heſitate what name I ought to add to this ſpecies. Dr. *Smith* tells me, it certainly is the *C. montana* of the Linnean herbarium; and that, from the quotation of *Plukenet*'s figure, we may be equally certain *Linnæus* deſcribed it from thence as his original *C. pilulifera*, without having a ſpecimen in his collection.

lection. It muſt be confeſſed, that the plant in the Linnean herbarium, *afterwards* gathered by Dr. *Solander* in Lapland, and named *pilulifera*, is very different from this I am now treating of. It is very robuſt and erect, the ſpikes alſo are larger and more crowded, neither is there any male ſpike to be ſeen. Probably it is the *Carex alpina* of the *Fl. Danica* 403. It muſt therefore be concluded that that was not the plant which *Linnæus* originally intended. I have no doubt but he ſpoke of one and the ſame plant under two names. I ſhould think that in its more fruitful ſtate, with three female ſpikes, he called it *pilulifera*: in its more ſtarved appearance, when produced on elevated and dry plains, where it has only two, and not unfrequently only one female ſpike, he called it *montana*.

The figures in *Plukenet* and *Moriſon* are very expreſſive, but are too erect. The roundneſs of the female ſpikes happens from the terminal flowers being uſually male and deciduous: as theſe wither away, the ſpikes aſſume their round form, otherwiſe they are in general oblong. The capſules are ſomewhat downy, as in *C. præcox*, but the linear male ſpike, the female ones ſeſſile, and the reclining culm, mark its diſtinction in all ſtages of its growth.

Mr. *Hudſon* having adopted the name *pilulifera*, and in conſequence that name having univerſally obtained with us, not to mention that it is more expreſſive than *montana*, I thought it beſt, upon mature deliberation, to continue it.

38. CAREX

38. CAREX RIGIDA. Tab. 22. *fig.* 10.

C. digyna, vaginis nullis, ſpicis oblongis ſub-ſeſſilibus, foliis ſub-recurvis rigidis.

Cyperoides germanicum, foliis brevibus rigidis acutis, &c. *Mich. Nov. Gen.* p. 61. t. 32. f. 4.

Carex ſaxatilis. *Fl. Angl.* 408.

Habitat in ſummo vertice montis Snowdon. Mr. *Hudſon.*

In alpibus Scoticis. Mr. *Dickſon.*

Aprili, Maio.

Radix craſſa, valde repens, perennis. *Folia* rigida, nigro-viridia, glauceſcentia, marginibus carinâque apicem verſus aſperis, recurva, culmo paulò breviora. *Culmus* erectus, ſæpe incurvus, circiter 4½ uncias altus, triqueter, angulis acutiſſimis aſperis, præ cæteris ſuæ altitudinis craſſus, rigidus. *Spicæ*, unica maſcula (rariùs duæ), duæ, tres fœmineæ, ad ſummum culmi approximatæ—Spica maſcula terminalis, oblonga, acutiuſcula, circiter ¾ unc. longa; ſquamis nigris, ovatis, obtuſiſſimis, margine membranaceo, nervo abbreviato dorſali viridi—Spicæ fœmineæ mari approximatæ, inferior remotiuſcula, oblongæ, acutiuſculæ, ſeſſiles (inferior ſæpè pedunculata), longitudine maris, floribus denſè imbricatis, flore uno aut altero terminali, præcipuè in ſpicis ſuperioribus, maſculo; ſquamæ nigræ, ovatæ, obtuſiſſimæ, &c. ut in maſculâ, demum capſulâ dimidio breviores. Ad ſpicas fœmineas bractea foliacea ſeſſilis, baſi utrinque auriculatâ—quæ ad ſpicam inferiorem ſita eſt, ſpicâ ſuâ longior eſt, & recurva—quæ ad ſuperiores, erectæ, & ſpicis ſuis breviores,

baſi pariter auriculatæ. *Capſula* ovata, hinc planiuſcula, glabra, obtuſiuſcula; variat autem producta, acutiuſcula, ſub-recurva.— *Filamenta* ut in cæteris. *Stylus* ſtigmatibus duobus, craſſiuſculis, albis, piloſis.

Obſ. Flores inferiores ſæpè remotiuſculi. *Capſulæ* ore indiviſo. Bractearum auriculæ ſatis magnæ, ſub-rotundæ.

This plant has often been confounded with the *ſaxatilis* of *Linnæus*, and the *montana* of Mr. *Hudſon*. It differs from the *montana*, by its having no vaginæ, two ſtigmata, and ſmooth capſules; from the *ſaxatilis*, by its being a thicker and much ſmaller plant; and from both, by the great rigidity of its leaves and incurved ſtalk. In Sir *Joſeph Banks*'s herbarium is a fine ſpecimen collected by Mr. *Hudſon*, the culms of which are much incurved. I have cultivated this plant, and find that the culm keeps the tendency to incurvation. I ſhould apprehend that the bleak expoſure on the tops of mountains contributes to the incurvation obſervable in its wild ſtate.

The rigidity of its leaves, and their being ſpread abroad, or, as it oftener happens, bent back, diſtinguiſh it from *cæſpitoſa*, whoſe leaves are upright and ſoft. By the ſame marks it may always be kept ſeparate from *C. ſtricta*, which alſo is altogether upright. But the fructification of theſe three ſpecies, eſpecially in the number of ſtyles, is very ſimilar.

It is poſſible that the root leaves of this plant, arched back, and of a firm nature, may afford protection to many of the winged inhabitants of the windy tops of alpine ſituations.

Conſidering the cold ſituation of the natal ſoil of this plant, it

ſeems ſomewhat ſurpriſing that, when planted in a garden, its leaves ſhould wither at the firſt approach of winter; but even in that ſtate they retain much of their rigidity.

I am indebted to that acute obſerver, Mr. *Dickſon*, for plants of this ſpecies brought by him from *Scotland*, where it is frequent upon the tops of high hills.

39. CAREX CÆSPITOSA. Tab. 21. *fig.* 8.

C. digyna, vaginis nullis, ſpicis ſub-ſeſſilibus ſub-cylindricis obtuſis, foliis erectis molliuſculis.

Buddle Hort. Sic. p. 30. n. 2.

Fl. Suecica, n. 855.

Habitat in paluſtribus, in nemoroſis humidis. Maio.

Radix valdè repens, perennis. *Folia* molliuſcula, amœnè viridia, ſub-glauca, erecta, culmum æquantia, marginibus carinâque apicem verſus aſperiuſcula. *Culmus* erectus 4-12 uncialis & ultra, ſub-debilis, triqueter, angulis acutis, aſperiuſculis. *Spicæ*, una maſcula (rariùs duæ), tres fœmineæ. Spica maſcula erecta, terminalis, ob-longa, triquetra, ¼-1 unciam longa; ſquamis ovatis, obtuſis—Spicæ fœmineæ duæ aut tres, ſub-cylindricæ, obtuſæ, ſub-ſeſſiles—ſcilicet inferior breviter pedunculata, ſuperiores ſeſſiles. Flores plerumque ſexfariàm, rarò octofariàm, denſè imbricati—Squamæ ovatæ, acutiuſculæ (ſed variant nec infrequenter obtuſæ), capſulâ maturâ breviores, nigræ, nervo dorſali viridi. Ad ſpicas fœmineas bractea foliacea, erecta, ſeſſilis, i. e. culmum ne minimè quidem amplectens,

baſi utrinque auriculata, auriculâ nigrâ rotundâ perſiſtenti, culmum modo æquans, plerumque ſuperans, interdum brevior. *Capſula* ovata, obtuſiuſcula, ſub-compreſſa, glabra, apice indiviſo. *Filamenta* ut in cæteris. *Stylus* ſtigmatibus duobus.

Obſ. Capſulæ perſiſtentes, nec deciduæ.

Having ſpoken very fully of this plant in my remarks upon *C. ſtricta*, I have only in this place to ſay, that this plant has been generally miſtaken in conſequence of the various aſſertions of authors who have written upon it. It was not till after repeated and careful examinations of the Linnean herbarium, that I could determine it; for the ſpecimens there preſerved ſeem choſen ones, and of courſe do not appear at firſt ſight to bear that exact reſemblance to the general habit which is obſervable with us. I was relieved from all doubt by Mr. *Afzelius*, who, from his intimate and accurate knowledge of the Swediſh plants, and not leſs perhaps of thoſe of our country, traced out to me *certain* marks of ſimilarity.

Obſ. The capſules uſually adhere to the rachis of the ſpike, even in decay. In *C. ſtricta*, they are deciduous as ſoon almoſt as they come to maturity—*C. cæſpitoſa* comes into flower a very conſiderable time after *C. ſtricta*, nearly or quite a month.

40. CAREX STRICTA. TAB. 21. *fig.* 9.

C. digyna, vaginis nullis, ſpicis ſub-ſeſſilibus cylindricis acutis; maſculis ſub-duabus, foliis erectis ſtrictis.

Gramen

Gramen cyperoides paluſtre ſpicâ pendulâ.
Loeſ. Pruſſ. p. 116. t. 30.

C. cæſpitoſa. *Fl. Angl.* 412. *Fl. Scot.* p. 560. var. β.

Habitat in paluſtribus. Propè Norwich. *D. Pitchford.* Aprili.

Radix valdè repens, perennis. *Folia* glauceſcentia, erecta, rectiſſima, culmo breviora, marginibus carinâque aſperis. *Culmus* pedalis, bipedalis & ultra, erectus, triqueter, angulis acutis aſperis. *Spicæ* maſculæ plerumque duæ, fœmineæ tres, omnes erectæ, ſubcylindricæ, acutæ. Spicæ maſculæ triquetræ 1—2 unciales, ſquamis oblongis, acutiuſculis, nigris, nervo dorſali viridi. Spicæ fœmineæ 1—2 unciales, infima breviter pedunculata, cæteræ ſeſſiles, floribus maſculis terminatæ, & inde acutæ; ſquamæ oblongæ acutæ, capſulis octofariàm imbricatis, paulò breviores. Ad ſpicas fœmineas bractea foliacea, ſeſſilis, erecta, inferior culmo plerumque paulò brevior (ſed variat culmo longior, necnon longè brevior), junior ſæpiùs auriculata, auriculâ oblongiuſcula, citò elongatâ, mox evanidâ—ſuperiores breviores, pariter auriculatæ. *Capſula* compreſſa, ovata, acuta, glabra, apice indiviſo. *Filamenta* ut in cæteris. *Stylus* ſtigmatibus duobus, albis, craſſiuſculis, villoſis.

Obſ. Folia radicalia, quæ baſin culmi amplectuntur, vaginam hinc membranaceam habent: membrana autem culmo luxurianti, mirè diſrumpitur, & quaſi in filamenta reticulato-connexa laceratur. Capſula citiùs decidua.

This *Carex* has many particulars in common with the *cæſpitoſa*; its upright culm and leaves, no vaginæ, ſeſſile ſpikes, and to appearance digynous flowers: hence many have thought them the ſame

ſame ſpecies. I am quite of a different opinion.—In the firſt place, *C. ſtricta* has the root-leaves which embrace the baſe of the culm, with the membranous part of the vagina, ſplit into threads after the manner of open net-work: then the root-leaves and the bracteæ are ſhorter than the culm at the time of flowering. Add to this, the bracteæ, particularly the lowermoſt, have either no auricles, or oblong ones, which are preſently ſo elongated as to diſappear, i. e. to loſe all form of auricles. The female ſpikes are acute, owing to their having male flowers at the ſummit. The ſcales are all acute—their capſules are ſet in eight rows, and two male ſpikes for the moſt part terminate the culm.

On the contrary, *C. cæſpitoſa* has the root-leaves, which embrace the baſe of the culm, with the membranous part always entire.—The root-leaves equal the culm in point of length at the time of flowering, the bracteæ are longer—The bracteæ always have little round auricles on each ſide of the baſe, which do not change their ſhape: the female ſpikes are obtuſe, and have no male flowers at their ſummit. The ſcales (though ſometimes they may be ſomewhat acute) are in general bluntiſh, not unfrequently very much ſo—The capſules are generally ſet in ſix, very rarely in eight rows, and it is ſeldom found with more than one male ſpike; beſides, it is every way a much ſmaller, weaker, and ſofter plant. I ſpeak here of the *general* appearance of theſe two ſpecies.

I have little doubt but *Loeſel* meant this plant, though he ſpeaks of it *ſpicâ pendulâ*; I ſuppoſe he means with an inclining ſtalk. He does not ſay, ſpic*is* pendul*is*—that would have been deciſive againſt me; but ſpic*â* pendul*â*, i. e. as I interpret him, with that part of the culm which bears the ſpikes, inclining: not that I ever ſcarcely obſerved it even ſo, for it is in general remarkably upright in its ſtature. Moſt probably *Loeſel* drew his figure from a dried ſpecimen.

ſpecimen. However, the habit of the plant which he has figured, the ſhortneſs of the leaves, and the apparent ſtrictneſs of the culm, make me look upon it to be *C. ſtricta*. Had it been drawn upright, there would have been little or no doubt.

I ſhould ſuppoſe that Dr. *Withering* meant this plant for his *cæſpitoſa:* but in ſome particulars the deſcriptions do not accord; perhaps they are taken from *cæſpitoſa* and *ſtricta* promiſcuouſly, on a ſuppoſition that they are the ſame.

The *younger Linnæus* once told me, that this was his father's *C. acuta, var. ruffa.* i. e. the *var.* α of the *Flora Suecica*, to which is quoted *Michelius*'s figure t. 32. f. 12. which is there ſaid to be exact. (We were examining a living plant in Kew-garden when this converſation paſſed). Now that figure has the female ſpikes with longiſh peduncles, which I never have obſerved the *ſtricta* to have. Had the ſpikes been ſeſſile, it would have been a very decent repreſentation of it. It could not be the *acuta* var. β of *Flora Suecica*, for that is, as appears evidently in the *Linnean herbarium*, the *C. gracilis* of Mr. *Curtis.* Certainly the growth of this plant anſwers to the name of *acuta* better than any other, having all its parts erect and ſharp pointed. I wiſhed to have named it ſo; but as the *gracilis* of Mr. *Curtis* is preſerved in the *Linnean herbarium* under the name of *acuta* (by which means we are ſure of one of the varieties), and as this has its title of *acuta*, var. *ruffa*, only from a converſation held accidentally with the *younger Linnæus*, I do not venture to change the name upon this authority. There would, I own, be great propriety in calling this plant *acuta*, and ſuffering Mr. *Curtis*'s very apt appellation of *gracilis* to remain with the other.

I muſt confeſs that I have but little doubt of this being the *acuta* var. *ruffa* of Linnæus *.—It is the only plant which accords with

* Since the reading of this paper, the Baroneſs d'Itzenplitz favoured me with a ſight of ſome *Carices*, ſent her from Upſal, among which I obſerved this plant named *acuta*.

Mr.

Mr. *Curtis*'s *gracilis*, in the leading points of the Linnean character: *Spicis maſculis pluribus, floribus digynis.*

It is obſervable, that *Michelius*'s figure has the female ſpikes acute, rendered ſo by the male flowers at the top; which appearance no Carex has ſo conſtantly as this.

Some years ago I received roots of this plant from Mr. *Pitchford* of *Norwich:* I have cultivated it ever ſince, together with *C. cæſpitoſa;* neither have I obſerved either of them vary from the deſcription given above.

41. CAREX RIPARIA.

C. ſpicis oblongis acutis; maſcularum ſquamis lanceolatis: fœminearum ariſtato-acuminatis, capſulis ovato-lanceolatis apice furcato-dentatis.

Petiv. Hort. Sic. vol. 1. p. 157.
Buddle, Hort. Sic. p. 28. n. 3, 4.

Cyperoides aquaticum maximum, &c. ſquamis in ariſtam longius productis, capſulis oblongis, bifidis. *Michel. Nov. Gen.* p. 57. t. 32. f. 6, 7.

Gramen cyperoides latifolium ſpicâ rufâ caule triangulo. *Mor. Hiſt. Ox.* III. ſ. 8. t. 12. f. 1.

Carex acuta, var. α. *Hudſ. Fl. Angl.* p. 413. *Fl. Scot.* p. 565.

Carex riparia, *Flora Londin.* & *Withering*, p. 105.

Habitat ad ripas foſſarum fluviorumque; in paluſtribus, & pratis humidioribus. Aprili, Maio.

Radix valdè repens, craſſa, perennis. *Folia* lata, erecta, ſupra pallidiora, ſubtus nigro-viridia, glauca, marginibus carinâque aſperrimis,

mis, culmum infloreſcentem ſub-æquantia—quæ culmi baſin ambiunt, vaginâ nervoſâ, nervis pulchrè reticulatis. *Culmus* erectus, firmus, triqueter, angulis acutiſſimis, aſperis, bipedalis & ultra. *Spicæ* tres maſculæ, totidem fœmineæ. Spicæ maſculæ terminales oblongæ, acutæ, triquetræ, angulis acutis, confertæ; ſquamis lanceolatis, acuminatis, nigris, nervo dorſali viridi. Spicæ fœmineæ oblongæ, & præ floribus terminalibus plerumque maſculis acutæ: una aut altera inferior pedunculata, pedunculo ſæpè longiuſculo, ſuperiores ſubſeſſiles, omnes erectæ. Squamæ lanceolatæ, ariſtato-acuminatæ, nigræ, nervo dorſali viridi, capſulâ longiores. Ad ſpicas fœmineas bractea foliacea; una aut altera inferior culmum ſæpiùs longè ſuperans, pedunculi baſin vaginâ breviſſimâ occupans: ſuperiores ſubſeſſiles, baſi plerumque auriculatæ, auriculatâ rotundiuſculâ, culmum aut æquantes aut paulò breviores, tenuiores. *Capſulæ* ſub-octofariàm imbricatæ, oblongo-ovatæ, acuminatæ, apice diviſo furcato, nervoſæ. *Filamenta* tria, antheris linearibus flavis. *Stylus* ſtigmatibus tribus.

There is ſcarcely a poſſibility of miſtaking this plant for any other. Its black, triangular, acute male ſpikes, and acuminated bifurcated capſules, muſt ever point out a moſt decided diſtinction.

He who would wiſh to obtain farther information, would do well to conſult the excellent figure and obſervations of Mr. *Curtis* in his *Flora Londinenſis*, or Mr. *Lightfoot*'s accurate deſcription in his *Flora Scotica*.

It varies a little occaſionally as to the robuſtneſs of its ſtature, and is met with ſometimes with blunt male ſpikes. *Buddle*'s No. 4. is an inſtance of it.

42. CAREX PALUDOSA.

C. ſpicis oblongis ſub-obtuſis; maſcularum ſquamis obtuſis: fœminearum lanceolatis, capſulis ovato-lanceolatis apice ſub-dentatis.

Carex acuta. *Fl. Londinenſis.* *Withering*, p. 1054.

Habitat in paluſtribus, & ad ripas foſſarum. Maio, Junio.

Radix valdè repens, perennis. *Folia* circiter ſemunciam lata, glauco-viridia, erecta, marginibus carinâque aſpera, culmo breviora, baſi rubra. *Culmus* pedalis, bipedalis, erectus, inæqualiter triqueter, angulis acutis aſperis. *Spicæ* plerumque tres maſculæ, totidem fœmineæ. Spicæ maſculæ terminales, approximatæ, triquetræ, angulis obtuſiuſculis, oblongæ, obtuſæ; ſquamis fuſcis, nervo dorſali viridi, oblongis, obtuſis. Spicæ fœmineæ oblongæ, ſæpiùs obtuſiuſculæ (ſed variant obtuſæ & acutæ pro præſentiâ aut abſentiâ florum maſculorum terminalium; ubi enim hi adſunt, acutæ evadunt), erectæ, inferior una aut altera breviter pedunculata, floribus arctìm imbricatis: ſquamæ lanceolatæ, valdè acutæ, fuſcæ, nervo dorſali viridi, capſulâ ſæpè longiores. Ad omnem ſpicam fœmineam bractea foliacea, inferior una aut altera culmo longior, baſi pedunculum breviſſimè amplectens; ſuperiores aut culmum æquantes, aut paulò breviores; baſi rariùs auriculatæ. *Capſulæ* ſubectofariàm imbricatæ, nervoſæ, ovato-lanceolatæ, acutiuſculæ, apice ante maturitatem integro, demum denticulis duobus breviſſimis conſpiciendo. *Filamenta* ut in cæteris. *Stylus* ſtigmatibus tribus.

This plant, which is ſo common with us, does not appear to have been noticed by *Linnæus*. It is often very variable in its

appearance, and comes ſo near *riparia*, that it is not to be ſeparated from it without a little cloſe attention. The ſcales of the male ſpike will afford a conſtant character: they are always more or leſs blunt in this ſpecies, and very acute in *riparia*. Its capſules are either not at all, or very ſlightly divided at the ſummit, but not roſtrated or furcated. From this circumſtance I am inclined to add the ſynonym of *Michelius*, t. 32. f. 6. to *riparia*—never having obſerved the capſules of *paludoſa* half ſo deeply divided.

43. CAREX ACUTA.

C. digyna, ſpicis filiformibus; fœmineis infloreſcentibus nutantibus: fructiferis erectis, capſulis acutiuſculis apice indiviſo.
Uvedale, Herb. Rayan. vol. 12. p. 61. n. 1.

Carex acuta, Var. β. *Fl. Suecica*, n. 857.

Carex gracilis. *Flora Londin.*—& *Withering*, 1053.

Maio.

Radix perennis, repens. *Folia* anguſta, amœnè viridia, erecta, apicibus pendulis, marginibus carinâque aſperis, culmo breviora. *Culmus* altitudine mirè variat, pro ſolo & ſitu, trientalis, pedalis, bipedalis & ultra, triqueter, angulis acutiſſimis, aſperis, ſub infloreſcentiâ ſæpiùs cernuus. *Spicæ* maſculæ duæ, rarò tres; fœmineæ tres; omnes filiformes, tenues. Spicæ maſculæ rectiuſculæ, 1—3 unciales, ſquamis oblongis, obtuſis, nigris, nervo dorſali viridi, inferiores breviores. Spicæ fœmineæ ſubſeſſiles (eſt ubi inferior una aut altera breviter pedunculata), ſub infloreſcentiâ nutantes ſ. recurvæ, maturiores erectæ, floribus terminalibus ſæpè maſculis, &

inde acutæ. Squamæ oblongæ, acutæ, nigræ, nervo dorſali viridi, capſulâ paulò breviores. Ad omnem ſpicam fœmineam bractea foliacea, ſeſſilis, baſi ſæpè auriculata, inferior culmo paulò longior, ſuperiores aut æquantes aut breviores. *Capſulæ* ſub-octofariàm imbricatæ, ovatæ, acutiuſculæ, compreſſæ, apice indiviſo, clauſo, arctìm imbricatæ. *Filamenta* tria, antheris linearibus flavis. *Stylus* ſtigmatibus duobus.

Whatever were the other variety of *C. acuta*, mentioned in the ſeveral writings of *Linnæus*, we are quite ſure that this was one, for it is now in Dr. *Smith*'s herbarium, ſo named by *Linnæus* himſelf. Unfortunately the other is not preſerved: however I can ſcarcely have a doubt but it was *C. ſtricta*, that being the only one which I know of, which bears any reſemblance to *Michelius*'s figure, t. 32. f. 12. I would not however wiſh to appear to be poſitive upon this head, as there is not that exact reſemblance in the figure, which, after the commendation beſtowed upon it by *Linnæus*, we have a right to expect.

The ſlenderneſs of the habit of this plant in all its parts, its filiform ſpikes, pendulous when in flower, its having the piſtillum with two ſtyles, and the capſules of a compreſſed form or flattiſh, and undivided at the ſummit, keep it evidently diſtinct from all others. I have never ſeen it leſs than three or four inches high (and that only in dry ſtarved land), and therefore ſtate it as ſuch.

Mr. *Curtis*, Dr. *Stokes*, and Mr. *Woodward*, all ſhewed good judgment in long ago ſuſpecting this to be the *C. acuta* of *Linnæus*. I derive my information only from ſeeing the plant ſince in the Linnean herbarium. I do not therefore take any merit to myſelf, as being wiſer than thoſe reſpectable gentlemen, but only deem myſelf more fortunate

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in my opportunity. *Linnæus* evidently confounded two ſpecies under the name *acuta*. As *Michelius*'s figure was ſaid by *Linnæus* to be an exact likeneſs of his firſt variety, and as there was no figure quoted to his ſecond, Mr. *Curtis*, unable to reconcile this plant to *Michelius*'s figure, judged it to be a diſtinct ſpecies, (who would not have done the ſame?) and called it *gracilis* accordingly.

44. CAREX VESICARIA.

C. ſpicis maſculis linearibus; fœmineis oblongis patentibus, capſulis inflatis oblongis roſtrato-acuminatis patentibus.
Buddle, Hort. Sic. p. 29. n. 2.

Gramen cyperoides majus præcox, ſpicis turgidis teretibus flaveſcentibus. *Hiſt. Ox.* III. 242. ſ. 8. t. 12 f. 6.
Fl. Suecica, n. 856. *Pollich.* n. 895. Var. *β*. *Leers*, t. 16. f. 2. III.

C. inflata. *Fl. Angl.* 412. *Fl. Scot.* 567. *Withering*, p. 1057. *Fl. Dan.* 647.

Habitat in paluſtribus. Maïo.

Radix repens, perennis. *Folia* pallidè virentia, culmum ſub inflorescentiâ ſuperantia, marginibus carinâque aſperis, anguſta. *Culmus* bipedalis, erectus, triqueter, angulis acutiſſimis aſperis. *Spicæ* circiter tres maſculæ, totidem fœmineæ. Spicæ maſculæ terminales, erectæ, ſuperior 1—2 uncialis, cæteræ breviores, lineares, ſub-triquetræ; ſquamis oblongis, obtuſiuſculis, flavis, marginibus apicem verſus albidis, nervo dorſali viridi, obſoletiuſculo. Spicæ fœmineæ oblongæ, pedunculatæ (inferior pedunculo ſatis longo, ſuperiores brevioribus), 1—2 unciales, erectiuſculæ; ſ. ſub-patentes.

patentes. Squamæ lanceolatæ, anguſtæ, acutiſſimæ, pallidæ, ſub inflorescentiâ capſulâ ferè duplo longiores, demum ſub matureſcentiâ iiſdem ferè duplo breviores. Ad omnem ſpicam fœmineam bractea foliacea, ſeſſilis, culmo longior. Bractea tenuis ſpicas maſculas etiam ſæpiùs ſubtendit; hæc culmo plerumque brevior.—*Capſulæ* laxiuſculè diſpoſitæ, patentes, glabræ, flaveſcentes, nervoſæ, ovato-oblongæ, acuminatæ, & quaſi roſtratæ, ore bifido. *Filamenta* ut in cæteris. *Stylus* ſtigmatibus tribus.

Obſ. Capſulam *C. depauperatæ* refert, at ſpicis fœmineis oblongis *multifloris*, & maſculis *pluribus* diſtinctiſſima.

Linnæus failed no where ſo much as in deſcribing his *C. veſicaria*. He makes this his firſt variety, *C. ſylvatica* his ſecond, and *C. ampullacea* his third. Amidſt ſo much confuſion, it was ſcarcely poſſible to find any union of opinion amongſt the ſeveral authors who afterwards treated of the ſame ſubject. It was plainly to be ſeen that they were diſtinct ſpecies—the difficulty lay in determining which was the original, and which the variety. Hence Mr. *Hudſon* (to whom we muſt all be ever indebted, as being the firſt author of a Linnean arrangement of the Britiſh plants), and Mr. *Lightfoot*, judged *ampullacea* to be the original, and under that impreſſion named this *inflata*. We are at length happily corrected as to theſe doubts by the herbarium of *Linnæus*, wherein this plant is named *veſicaria*. Its yellow hue, narrow ſhort ſcales, and inflated ſmooth conic capſules, point it out beyond all danger of miſtake.

Scheuchzer gives a long deſcription of this plant, p. 470.

45. CAREX AMPULLACEA.

C. ſpicis filiformibus; maſculis tenuioribus; fœmineis teretibus erectis, capſulis inflatis globoſis ariſtato-roſtratis divaricatis.
Buddle, Hort. Sic. p. 29. n. 1.

Gramen cyperoides medium anguſtifolium, ſpicis teretibus erectis flaveſcentibus. *Moriſ. Hiſt. Oxon.* III. 242. ſ. 8. t. 12. f. 8.

Carex veſicaria. *Fl. Angl.* 413. *Fl. Scot.* 566. *Pollich.* n. 895.
Var. α.

Carex roſtrata. *Withering*, p. 1059.

Habitat in paluſtribus aquoſis. Maio.

Radix valdè repens, perennis. *Folia* glauca, erecta, anguſta, culmo longiora, marginibus carinâque magnâ ex parte aſpera.—*Culmus* pedalis, bipedalis, erectus, triqueter, angulis acutis, ſummum verſus aſperis, ſæpiùs autem infra ſpicam inferiorem glabris. *Spicæ* duæ aut tres maſculæ, totidem fœmineæ. Spicæ maſculæ ex lineari filiformes; ſumma ſæpiùs modicè incurva, uncialis etiam aliquando biuncialis, cæteræ breviores—Squamæ oblongæ, acutiuſculæ (variant etiam obtuſæ), flaveſcentes, nervo dorſali viridi, margine tenero albo. Spicæ fœmineæ cylindricæ, unciales, biunciales, erectæ, pedunculatæ, pedunculis brevibus, inferiori longiore. Squamæ lanceolatæ, acutæ, flaveſcentes, margine pallido, nervo dorſali viridi, capſulâ ferè duplo breviores, interdum præ morbo quodam fortaſſe, æquales. Ad omnem ſpicam, vel maſculam vel fœmineam, bractea foliacea, anguſta, erecta; ſuperiores culmo breviores, una aut altera inferior multo longior, omnes ſeſſiles. *Capſulæ* arctìm octofariàm imbricatæ, inflatæ, globoſæ, ariſtato-acuminatæ,

natæ ſ. roſtratæ, divaricatæ, ore bidenticulato, flaveſcentes, nervoſæ.—*Filamenta* ut in cæteris—*Stylus* ſtigmatibus tribus.

Obſ. Folia radicalia quæ culmi baſin obveſtiunt vaginâ hinc membranaceâ, quæ mox in filamenta reticulatìm connexa diſrumpitur, uti in *C. ſtrictâ* accidit.

As *Linnæus* has diſtinguiſhed other plants which have their ſeed-veſſels ſhaped ſomewhat like this, by the trivial name of *ampullaceus*, I have adopted that appellation, as being more expreſſive than *roſtrata*, which is a term common to many, viz. *Pſeudo-cyperus*, *depauperata*, *ſylvatica*, *veſicaria*, &c. &c. Beſides we have the authority of *Haller* for this name, who had firſt deſcribed it, *capſulis ampullatis roſtratis.*

This ſpecies is not common near *London*; although, from the different authors which I have cited, it appears to be an inhabitant of many parts of this iſland. It is to be met with plentifully at Virginia water. I do not know how to add *Leers*'s figure 16. 2. n. 2. becauſe he deſcribes the female ſpikes pendulous—a circumſtance I do not remember ever to have ſeen.

46. CAREX HIRTA.

C. piloſa, ſpicis omnibus oblongis; fœmineis remotis vaginatis: vaginis hinc lanato-villoſis, capſulis hirtis.
Buddle, Hort. Sic. p. 30. n. 1.

Gramen cyperoides polyſtachion lanuginoſum. *Mor. Hiſt. Ox.* III. 243. ſ. 8. t. 12. f. 10.

Flor. Suec. 858. *Leers*, t. 16. f. 3. *Fl. Angl.* 414. *Fl. Scot.* 568. *Pollich.* n. 897. *Fl. Dan.* 379.

Habitat

Habitat in pratis & paſcuis humidis, in aquoſis & paluſtribus. Maio, Junio.

Radix valdè repens, perennis. *Folia* ferè ſemunciam lata, villoſa, ad oras carinaſque hiſpida, culmo ſub-breviora. *Culmus* erectus, triqueter, angulis acutiſſimis, aſperis. *Spicæ* duæ maſculæ, tres fœmineæ—Spicæm aſculæ oblongæ, ſub-unciales, erectæ; ſquamis ovatis, fuſcis, margine albo, nervo dorſali viridi, piloſis, obtuſis, & ex nervo prominenti breviſſimè mucronatis. Spicæ fœmineæ ſæpiùs valdè remotæ, oblongæ, erectæ, inferiores longiùs pedunculatæ; ſquamis villoſis, ovatis, longiùs mucronato-acuminatis, margine albido, nervo dorſali viridi. Ad omnem ſpicam fœmineam bractea foliacea, quæ ad ſpicas inferiores ferè dimidium pedunculi occupat, vaginâ hinc lanato-villoſâ.—Porro bractea una aut altera inferior culmum ſæpiùs ſuperat. *Capſulæ* laxiuſculè diſpoſitæ, ovatæ, acutæ, hinc planæ, illinc convexæ, hirtæ, ſub-roſtratæ, roſtro bifido, ſquamis paulò longiores. *Filamenta* tria, antheris ſordidiuſculè flavis. *Stylus* ſtigmatibus tribus.

The thick down which covers the leaves, and particularly the vaginæ and capſules of this ſpecies, keeps it moſt manifeſtly diſtinct from all others.

I have ſpecimens of a Carex, given me by Mr. *Lightfoot*, which he informed me he met with in Scotland; it is an androgynous ſpecies, and nearly related to *axillaris*, if not the very ſame. The terminal ſpike is for the moſt part, but not altogether, male; a few female flowers appearing at the baſe. The ſpikes are ſeſſile in the axillæ of ſlender bracteæ, which are longer than

the culm; neither are they, except the lowermoſt, remote from each other. I do not obſerve any male flowers in the axillary ſpikes. The ſcales are oblong and acute, with a ſtrong nerve on the back, which forms an acute point. The capſules are oblong and acute, and ſlightly bifid at the point, and do not appear to be quite ſo long as the ſcales. The ſpikes are all ſolitary.

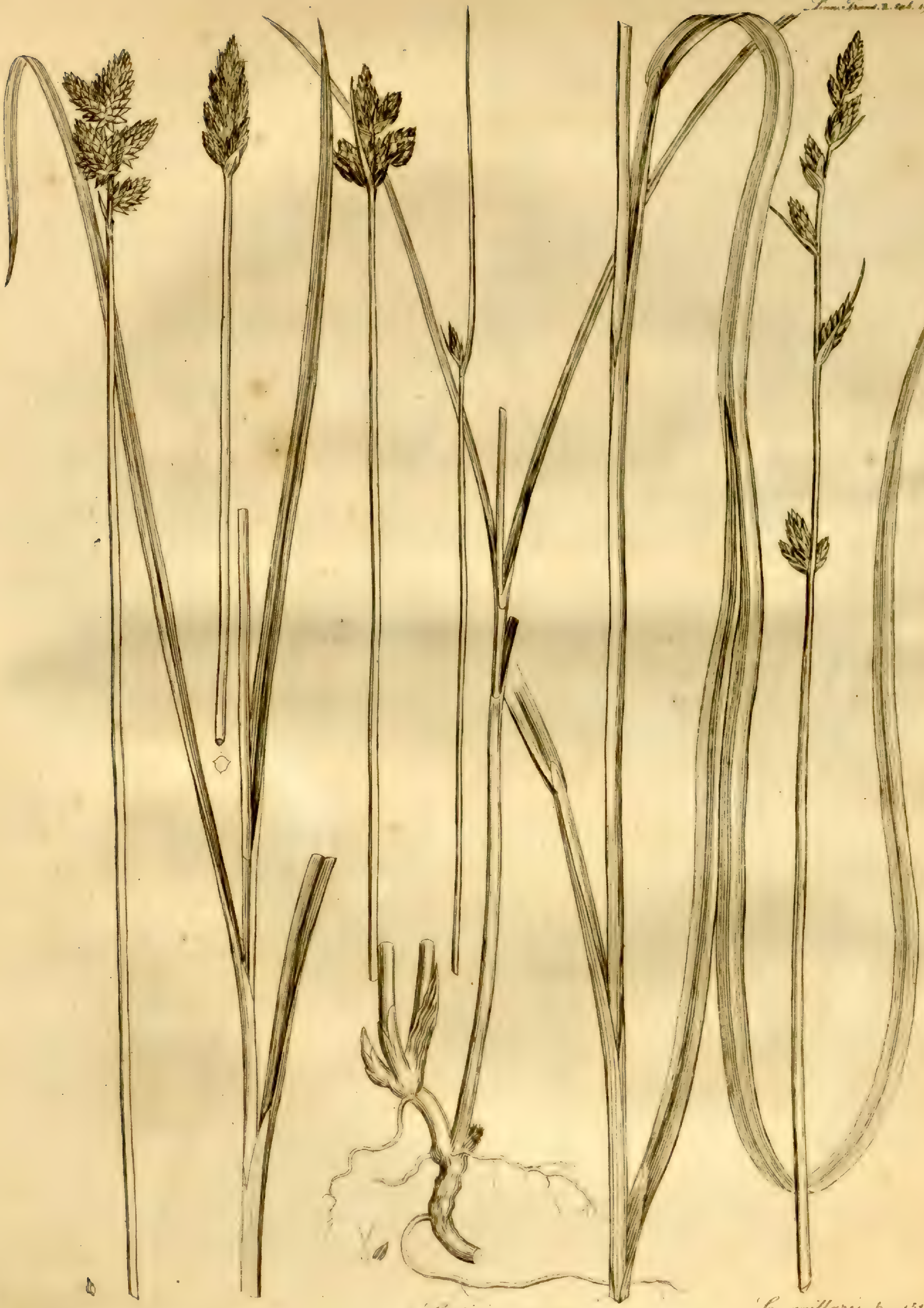
It is diſtinct from *remota* by its bifid capſule.—It ſeems different from *axillaris* by all the ſpikes being ſolitary: but this laſt circumſtance has raiſed a doubt in my mind, whether the ſpecific character which I have given *axillaris*, be juſt: in particular, it prevented me from calling it *aggregata*, under which title my very ſkilful and accurate friend and fellow-labourer, Mr. *Curtis*, has ſpoken of it. As he has not yet publiſhed his obſervations, I take the advantage of conſulting my fears, viz. that in bleak and barren expoſures it produces its ſpikes ſolitary and not aggregate; and give it the name of *axillaris*, a name by which poſſibly it was known originally to *Linnæus*, though, perhaps afterwards thinking it the ſame as *remota*, he rejected it as a diſtinct ſpecies.

My ſpecimens are too ſmall and too much damaged to enable me to ſpeak, with certainty, whether it be *axillaris* or not. They are ſpecimens of the whole plant from the crown of the roots, but not of the root itſelf: they appear to be from four to ſix inches high.

I have thus the honour of laying before the Linnean Society, my obſervations upon the Britiſh ſpecies of the genus *Carex*. I have purpoſely gone no farther into minuteneſs of inveſtigation than appeared to be neceſſary to a ſufficient knowledge of the objects themſelves. I am aware, however, that the more minutely objects

are

Linn. Trans. 2. tab. 19. p. 210.



3. *C. tereti-ovata. p. 163.*

2. *C. divisa. p. 157.*

1. *C. axillaris. p. 151.*

6. *C. fulva. p. 177.*

5. *C. filiformis. p. 172.*

4. *C. strigosa. p. 169.*

Linn. Trans. 2. tab. 21. fig. 210.

8. C. cæspitosa. p. 196.

9. C. stricta. p. 196.

7. C. extensa. p. 175.

Linn. Trans. II. tab. 22. p. 210.

10. C. rigida. p. 193.

are examined, the more ſtriking are their differences. Still, however, much is due to the conſideration of practical ſtudy—He is the beſt mechanic, who produces the greateſt effect, by the leaſt given power: and thus, in a ſtudy like ours, he who diſcriminates moſt plainly, be the plainneſs ſimple as it may be, diſcriminates moſt laudably and ſatisfactorily.

There are four points of ſome importance to the completing of the arrangement of the *Carices*, which I have ſcarcely touched upon, viz. the defining with exactneſs the true limits of the generic character—the ſettling of the ſynonyma—the collecting and ſettling of the eſſential differences of the foreign ſpecies—and the drawing out microſcopic deſcriptions of the parts of fructification. My object is attained, if I have contributed at all to the knowledge of thoſe of our own country, and that by means open to eaſy obſervation.

Before I conclude, I muſt beg leave to return my particular thanks to Dr. *Smith* for the opportunities he has given me of conſulting the Linnean Herbarium; and eſpecially to Sir *Joſeph Banks*, whoſe matchleſs library, and moſt extenſive collections, ſo liberally open to the peruſal of all real lovers of Natural Hiſtory, were of moſt eſſential ſervice to me in the execution of this Tract.

XVII. *On Genera and Species of Plants which occur twice or three times, under different Names, in Professor Gmelin's Edition of Linnæus's Systema Naturæ. By Jonas Dryander, M. A. Libr. R. S. and F. L. S.*

Read July 3, and October 2, 1792.

Page 5. AMOMUM CURCUMA of Jacquin is the same as *Curcuma longa*, page 8. so far as Linné by that name meant the officinal *Curcuma*, and certainly the same as the figure of Regnault, which the Editor quotes for *Curcuma longa*, though that figure is not very good; nor does it differ from the *Curcuma longa* of Koenig, in Retzii Obs. Bot. 3. page 72, the flowers of which, sent by Koenig, preserved in spirits, I have compared with Jacquin's description and figure, and found them to agree.

This plant does not agree with the generic character which Linné has given of *Curcuma* in Musa Cliffort. page 15, from thence copied in the different editions of his Genera Plantarum; but that character was evidently drawn up from his *Curcuma rotunda*, the *Manja-kua* of the *Hortus Malabaricus*, a plant unknown to me, but which, to judge from Rheede's figure, is very different in fructification from the officinal *Curcuma*. Linné has no doubt been led into this mistake by the assertion in *Hortus Malabaricus*, that

the flower of *Manjella-kua*, or the officinal *Curcuma*, is like that of *Manja-kua*, and by the figure of a ſingle flower of the natural ſize given by Hermann with his reduced figure of the officinal *Curcuma*. This flower is exactly like that of *Manja-kua* in the *Hortus Malabaricus*, but cannot be copied from thence, as Hermann's book was publiſhed before the 11th volume of that work; I can no otherwiſe account for this ſimilarity, than by ſuppoſing that Hermann had ſeen the drawing before the publication. The reduced figure of the whole plant, given by Hermann, is alſo erroneous, repreſenting the ſcapus at a diſtance from the leaves; whereas it appears by the accounts of the *Hortus Malabaricus*, Rumphius, Koenig, and Jacquin, that the ſcapus comes out between the leaves.

Page 6. *Amomum ſpurium*, Zinziber ſpurium of Koenig, is the ſame as *Amomum zerumbet*, p. 5, as may eaſily be ſeen by comparing Koenig's deſcription with Murray's and Jacquin's figures and deſcriptions. There is an error of the preſs in the quotation from Koenig, which ſhould be, p. 60 inſtead of 59: in the latter page is found Koenig's *Amomum Cardamomum*, which the Editor has paſſed over, though it is a different ſpecies from Linné's *Amomum Cardamomum*; it is mentioned by Thunberg in his Flora Japonica, p. 15, under the name of *Amomum Cardamomum javanicum*.

Page 7. *Alpinia occidentalis* of Swartz, and p. 8. *Alpinia jamaicenſis* of Gærtner, are the ſame.

Page 9. *Tſiana ſpecioſa*, Bankſea ſpecioſa of Koenig, is *Coſtus arabicus* of Jacquin, *Coſtus ſpecioſus* of Dr. Smith, in the firſt volume of our Society's Tranſactions, and *Coſtus arabicus* of Swartz prodr. from whence the Editor has borrowed the differentia ſpecifica of *Coſtus arabicus*, in p. 7.

Page 16. *Hippuris tetraphylla* Linn. Suppl. and *Hippuris lanceolata* of Retzius, are the ſame.

Page 23. *Nyctanthes acuminata* of the younger Burmannus is the ſame as *Nerium coronarium*, p. 435, if we may judge from the ſynonyms quoted by Burmannus, which all belong to the *Nerium coronarium* of Jacquin.

Page 26. *Chionanthus compacta* of Swartz, and *Chionanthus caribæa* of Jacquin, are the ſame.

Ceranthus of Schreber is *Chionanthus incraſſata* of Swartz, as the latter has informed me by letter.

Page 27. *Hebe* of Juſſieu is *Veronica decuſſata*, p. 30. See Tableau Methodique du Chev. de la Marck, p. 45. n. 182.

Page 31. *Pæderota cærulea* of Scopoli and Linn. Suppl. is *Pæderota Bonarota* ſp. pl. *Pæderota lutea* of Scopoli and Linn. Suppl. is *Pæderota Ageria* Linn. Mant.

Page 32. *Juſticia ſpinoſa γ. Juſticia appreſſa* of Forſkâhl is *Barleria Prionitis*, p. 959, according to Vahl, ſymb. 1. p. 46.

Page 33. *Juſticia lanceata* of Forſkâhl is the ſame as p. 960. *Barleria noctiflora* of Linn. Suppl. which I know both from Vahl, loc. cit. and from the compariſon of a ſpecimen from Forſkâhl in Sir Joſeph Banks's herbarium, with ſpecimens ſent from Koenig of the *Barleria noctiflora*.

Page 34. *Juſticia viridis* of Forſkâhl is *Juſticia Ecbolium*, p. 32. See Vahl, ſymb. 1. p. 2.

Page 38. *Gratiola veronicifolia* of Koenig and Retzius is the ſame as *Ruellia antipoda*, p. 959.

Page 40. *Utricularia inflexa* of Forſkâhl is not a different ſpecies from *Utricularia ſtellata* of Linn. Suppl. in the opinion of Profeſſor Vahl, ſymb. 1. p. 6. *Fagelia flavicans* is *Calceolaria pinnata*, p. 39.

Page 49. *Thouinia nutans*, Linn. Suppl. is *Chionanthus zeylanica*, p. 26*.

* Page 50. *Pentagloſſum linifolium* of Forſkâhl is already in Reichard's edition of the Syſtema Plantarum, given as a ſynonym of *Lythrum Thymifolia*, p. 753.

Page

Page 52. *Orchis rubra* of Jacquin is *Orchis papilionacea* Linn.

Page 54. *Orchis filicornis*, and p. 58. *Ophrys patens*, are the ſame.

Page 56. *Satyrium elatum* of Swartz, and p. 59. *Serapias Neottia*, Neottia minor of Jacquin, are the ſame: the Editor alſo quotes the ſame figure of Plumier for both*.

Page 76. *Anthoxanthum paniculatum*, *Poa Gerardi*, p. 179, and *Feſtuca ſpadicea*, p. 186, are the ſame. See Dr. *Smith*'s paper on this graſs, in the firſt volume of our Society's Tranſactions.

Page 77. *Piper latifolium*, and, p. 78, *Piper methyſticum*, is the ſame ſpecies of Linn. Suppl. taken up twice with the ſame differentia ſpecifica, but different trivial names. Young Linné had, in the Supplement, deſcribed the Piper latifolium of Solander and Forſter, and miſtaking it for the ſpecies from which the intoxicating liquor Ava is made, he applied to it the trivial name of methyſticum, which Forſter had given to the latter one; but on his coming to England, he was informed of his miſtake, and deſired Mr. Ehrhart, who had the direction of the printing of the Supplement, to rectify it, which was done by inſerting in the laſt page of the book a correction, to read latifolium for methyſticum.

Page 79. *Piper ſtellatum* of Swartz is, I believe, the ſame as *Piper verticillatum*, p. 78; at leaſt I can ſee no other difference, than in the length of the ſpikes, between Browne's ſpecimen of the latter in Linné's herbarium, and a ſpecimen from Jamaica in Sir Joſeph Banks's herbarium, which D. Swartz has marked as his P. ſtellatum.

Page 97. *Ficus vaſta* of Forſkâhl is *Ficus benghalenſis*, p. 96. See Vahl, ſymb. 1. p. 82.

Page 71. *Koſaria* of Forſkâhl is the ſame genus as *Dorſtenia*, p. 265. See Lamarck, in Act. Soc. Hiſt. Nat. Pariſ. p. 85. It is very improperly quoted in Linn. Suppl. as a ſynonym for Ocymum capitellatum.

Page

Page 105. *Loeflingia indica* of Koenig and Retzius has *Pharnaceum depreſſum* of Linn. Mant. for ſynonym, but ſtill occurs again, p. 506, under the latter name.

Page 106. *Alternanthera* of Forſkâhl, is *Illecebrum ſeſſile*, p. 427. See Vahl, ſymb. 1. p. 22.

Page 108. *Ixia Lapeirouſia*, La Peyrouſia compreſſa of Pourret, is the ſame as p. 111. *Gladiolus anceps* of Thunberg, and Linn. Suppl.

Page 117. *Moræa fugax* of Jacquin is the ſame as, p. 116, *Iris edulis* of Thunberg.

Page 119. *Ariſtea cyanea* of Hort. Kew. and, p. 117, *Moræa africana* of Thunberg, Ixia africana, Spec. plant. are the ſame.

Page 125. *Scirpus fiſtuloſus* of Forſkâhl is *Scirpus articulatus*, p. 124. See Vahl, ſymb. 1. p. 8.

Page 126. *Scirpus niloticus*, Scirpus biſumbellatus of Forſkâhl, is *Scirpus dichotomus*, p. 128. See Vahl, ſymb. 1. p. 8. Profeſſor Vahl alſo joins with them the *Scirpus annuus* of Allioni, which the Editor, by a ſtrange miſtake, has arranged in the firſt diviſion of the genus, p. 124, though it has umbella decompoſita.

Page 128. *Scirpus cyperoides* is referred by the Editor himſelf, in p. 122, to *Kyllinga ſumatrenſis*, as a ſynonym; and here he quotes, as figure of it, Rottboell, tab. 4. fig. 2. which is Kyllinga umbellata.

Page 129. *Cyperus niloticus* of Forſkâhl is, in the opinion of Profeſſor Vahl, ſymb. 1. p. 7. not a different ſpecies from *Cyperus articulatus*.

Page 131. *Cyperus ferrugineus* of Forſkâhl is *Cyperus fuſcus*, p. 133. See Vahl, ſymb. 1. p. 8.

Page 136. *Schoenus cyperoides* of Koenig and Retzius is the ſame as *Cyperus triflorus*, p. 133. In p. 137. is a different Schoenus cyperoides, from Swartz.

Schoenus

Schoenus odoratus is the ſame as *Kyllinga triceps*, p. 122. See Rottb. deſcr. et ic. p. 14.

Page 143. *Carex pendula* of Hudſon and Curtis is the ſame as, p. 145. *Carex Agaſtachys* of Ehrhart.

Page 151. *Axyris ceratoides* is the ſame as, p. 274. *Kraſchenninikoſia latens*, Kraſchenninikouia Ceratoides of Güldenſtædt; and p. 424. *Achyranthes pappoſa* of Forſkâhl is alſo the ſame; ſee Vahl, ſymb. 1. p. 76.

Page 152. *Saccharum Koenigii* of Retzius, Saccharum diandrum of Koenig, is, I believe, the ſame as *Lagurus cylindricus*, p. 194.

Page 153. *Phalaris aſpera* of Retzius is probably the ſame as, p. 167. *Phleum paniculatum* of Hudſon.

Page 154. *Phalaris diſticha* of Forſkâhl is, by Profeſſor Vahl, ſymb. 1. p. 9. referred to *Agroſtis pungens*, Schreb. gram. 2. p. 46. tab. 27. f. 3.; and in comparing this figure with a ſpecimen in Sir Joſeph Banks's herbarium, from Forſkâhl, and another from Abbé Pourret, of his Agroſtis pungens, which the Editor has taken up, p. 171. from Lamarck, I ſee no reaſon to doubt the identity of theſe three plants.

Phalaris velutina of Forſkâhl is *Panicum ſanguinale*, p. 159. See Vahl, ſymb. 1. p. 8.

Phalaris ſetacea of Forſkâhl is *Panicum polyſtachyon*, p. 156. See Vahl, ſymb. 2. p. 18.

Page 158. *Panicum tetraſtichon* of Forſkâhl is *Panicum colonum*, p. 157. See Vahl, ſymb. 1. p. 9.

Panicum fluitans of Koenig and Retzius, and *Panicum geminatum* of Forſkâhl, are the ſame. See Vahl, ſymb. 1. p. 8.

Page 159. *Panicum compreſſum* of Forſkâhl is *Cynoſurus indicus*, p. 185. See Vahl, ſymb. 2. p. 21.

Page 173. *Holcus exiguus* of Forſkâhl is *Holcus halepenſis*. See Vahl, ſymb. 1. p. 81.

Holcus Durra of Forſkâhl (miſprinted *Duna)* is *Holcus Sorghum* (miſprinted *Soryhum).* See Vahl, ſymb. 1. p. 80.

* Page 182. *Poa cynoſuroides* of Retzius, Poa madraſtenſis of Koenig, is the ſame as, p. 183. *Uniola bipinnata.*

Poa multiflora of Forſkâhl is *Briza Eragroſtis*, p. 183. See Vahl, ſymb. 2. p. 20.

Page 183. *Poa ſicula* of Jacquin's collect. et ic. *Briza cynoſuroides* of Scopoli, and, p. 185. *Cynoſurus ſiculus* of Jacquin's obſ. bot. are the ſame; and the Editor quotes the ſame figure for the firſt and the laſt. It is the Triticum unioloides of Hort. Kew. and Triticum brizoides of Lamarck, encycl. 2. p. 561.

Page 185. *Cynoſurus lagopoides* of Burmannus ſhould, according to the ſynonym of Plukenet, be *Illecebrum Monſoniæ*, p. 426; but as I cannot ſuppoſe that any botaniſt could miſtake an Illecebrum for a graſs, I muſt only conclude that a wrong figure has been quoted.

Page 187. *Feſtuca dichotoma*, and, p. 188. *Feſtuca lanceolata* of Forſkâhl, are the ſame as *Triticum maritimum*, p. 200. See Vahl, ſymb. 2. p. 26.

Page 189. *Bromus aſper* of Linn. Suppl. is the ſame as, p. 190. *Bromus montanus* of Pollich, and *Bromus hirſutus* of Curtis, whoſe differentia ſpecifica the Editor has copied, without quoting him, but referring to Hudſ. Angl. 51, where it is true that this plant occurs, but under the name of Br. nemoralis, and with a different ſpecific deſcription. To make the confuſion ſtill greater, Curtis's figure is quoted under Br. ramoſus of Linn. Mant. which is quite a different plant, and not found in England.

Page 190. *Bromus villoſus* of Forſkâhl is *Bromus madritenſis*, p. 188. See Vahl, ſymb. 2. p. 23.

* Page 176. *Melica Lobelii* of Villars, and *Melica uniflora* of Retzius and Curtis, are the ſame. See Lamarck in Act. Soc. Hiſt. Nat. Pariſ. 1. p. 85.

Page 191. *Stipa arguens* is the ſame as *Anthiſtiria ciliata*, p. 194.

Page 196. *Ariſtida lanata* of Forſkâhl is *Ariſtida plumoſa*, p. 195. See Vahl, ſymb. 1. p. 11.

Ariſtida paniculata of Forſkâhl is *Ariſtida adſcenſionis*, p. 195. See Vahl, ſymb. 2. p. 25.

Page 197. *Rottboellia corymboſa* of Linn. Suppl. *Ægilops* exaltata of Linn. Mant. is the ſame as *Rottboellia punctata* of Retzius.

Page 198. *Secale proſtratum* of Pallas is the ſame as, p. 200. *Triticum proſtratum* of Linn. Suppl.

Page 199. *Hordeum imrinum* of Forſkâhl, and *Hordeum geniculatum* of Allioni, are the ſame. See Vahl, ſymb. 2. p. 25.

Hordeum ſecalinum of Schreber, and *Hordeum maritimum* of Müller, are the ſame, in the opinion of Profeſſor Retzius, Fl. Scandin. n. 144.

Page 200. *Triticum bromoides* of Wiggers is *Bromus pinnatus*, p. 190.

Page 203. *Phyllanthus ſpecioſus* of Jacquin is the ſame as *Xylophylla latifolia*, p. 499.

Page 206. *Eriocaulon amplexicaule* of Rottböll is the ſame as, p. 570. *Tonina fluviatilis* of Aublet.

Page 223. *Protea brumiades* of Linn. Suppl. and *Protea corymboſa* of Thunberg, are the ſame.

Page 227. *Lidbeckia capenſis*, Lidbeckia pectinata of Bergius, is *Cotula ſtricta*, p. 1250.

Page 230. *Scabioſa altiſſima* of Jaquin, which the Editor has taken up as variety β. of Scabioſa africana, is *Scabioſa indurata*, Linn. Mant.

Page 231. *Crinita capenſis* of Houttuyn is the ſame as, p. 244. *Pavetta caffra*, Linn. Suppl.

Page 232. *Hedyotis americana* of Jacquin is the ſame as *Hedyotis rupeſtris*, which the Editor has borrowed from Swartz, prodr. 29.

without quoting him, and without attending to the reference to Jacquin.

Page 233. *Scabrita ſcabra* is certainly the ſame as *Nyctanthes Arbor triſtis*, p. 23.

Page 235. *Aſperula calabrica* Linn. Suppl. and, p. 243. *Pavetta fœtidiſſima* of Cyrillo, are the ſame.

Page 243. *Ixora alternifolia* of Jacquin remains here, though the Editor has very properly quoted Jacquin's figure under *Ceſtrum veſpertinum*, p. 388.

Page 250. *Buddleja globoſa* of Hope is the ſame as *Buddleja capitata* of Jacquin.

Page 254. *Scoparia ternata* of Forſkâhl is *Scoparia dulcis*, according to Vahl, ſymb. 1. p. 12.

Page 256. *Ciſſus arborea* of Forſkâhl is *Salvadora perſica*, p. 280. See Vahl, ſymb. 1. p. 12. *Rivina paniculata*, p. 278. is alſo the ſame; it has remained in all the editions of the Syſtema Vegetabilium and Syſtema Naturæ ſince the tenth edition, though it is referred to Salvadora perſica in Spec. plant. ed. 2. p. 178. *Embelia indica*, p. 280. muſt alſo be conſidered as the ſame, as the Editor has taken the character of it from Retzius, whoſe Embelia Groſſularia is the Salvadora perſica. Embelia Ribes of Burm. ind. 62. Ribeſioides Linn. Fl. Zeyl. 403, is a very different plant; it is by Gærtner, ſem. 1. p. 189, referred to the genus of Antideſma, from its drupa nuce ſcrobiculata.

Page 259. *Junghanſia faginea* is the ſame as, p. 247. *Relhamia* (read Relhania) *faginea*, Curtiſia faginea of Hort. Kew.

Page 260. *Sceura marina* of Forſkâhl is *Avicennia tomentoſa*, p. 963. See Vahl, ſymb. 1. p. 47.

Sirium myrtifolium, and, p. 276. *Santalum album*, are the ſame.

Page 261. *Ludwigia repens* of Swartz is *Iſnardia paluſtris*, p. 265.

Page

Page 262. *Azima nova* is, I ſuppoſe, meant for Azima tetracantha of Lamarck, and then it is the ſame as, p. 254. *Monetia barlerioides* of L'Heritier. Azima diacantha of Lamarck is only taken from Plukenet's figure, and conſequently doubtful.

Page 263. *Oldenlandia repens*, and, p. 370. *Dentella repens* of Forſter, are the ſame.

Oldenlandia tenuifolia is the ſame as *Hedyotis herbacea*, p. 232.

Page 269. *Urtica elongata*, Urtica Japonica of Linn. Suppl. is probably the ſame as *Urtica ſpicata* of Thunb. Japon. at leaſt I cannot find there any other ſpecies it can be; and it is natural to ſuppoſe that a plant from Japan, which young Linné had received from Thunberg, muſt be found in the Flora Japonica of the latter.

Page 272. *Maprunea guianenſis* of Aublet is *Ægopricon betulinum*, p. 18. See Smith ic. plant. 42.

Page 275. *Moſcharia* of Forſkâhl is *Teucrium Iva*, p. 893. See Vahl, ſymb. 1. p. 40.

Nigrina ſpicata of Thunberg is certainly the ſame as, p. 280. *Chloranthus inconſpicuus* of Swartz. The diſcovery of the identity of them was made by Profeſſor Swartz himſelf, on ſeeing the Nigrina in Chevalier Thunberg's herbarium.

Page 279. *Nacibea coccinea* of Aublet is certainly the ſame genus as *Manettia*, p. 277, which differs only from Cinchona in the number of the foliola calycina being double to that of the diviſion of the corolla and of the ſtamina. Nacibea alba, having the number of the foliola calycina equal to the diviſions of the corolla and the ſtamina, may be more properly referred to the genus Cinchona, as the mere difference in number cannot be ſufficient to ſeparate genera.

Page 283. *Morus tinctoria*, and *Morus Xanthoxylum*, are the ſame.

Page 284. *Laurembergia capenſis*, Laurembergia repens of Bergius, is the ſame as *Serpicula repens*, p. 276.

Page

Page 286. *Gomozia granadenſis* is the ſame as *Nertera depreſſa*, p. 282. See Smith ic. plant. 28.

Page 314. *Heliotropium coromandelianum* of Koenig, and *Heliotropium ovalifolium* of Forſkâhl, are the ſame. See Vahl, ſymb. 1. p. 13.

Page 318. *Anchuſa tuberculata* of Forſkâhl is *Lithoſpermum orientale*, p. 316. See Vahl, ſymb. 1. p. 14.

Anchuſa flava of Forſkâhl is *Aſperugo ægyptiaca*, p. 321. See Vahl, ſymb. 1. p. 14.

Page 324. *Tournefortia humilis* is the ſame as *Heliotropium fruticoſum*, p. 314.

Page 339. *Endrachium madagaſcarienſe* is the ſame as *Smithia Thouinia*, p. 388. Thouinia ſpectabilis of Smith. See Smith ic. plant. faſc. 2. p. 6.

Convolvulus Hermanniæ of L'Heritier, and, p. 341, *Convolvulus crenatus* of Jacquin, are the ſame.

Page 340. *Convolvulus nervoſus* of Burmannus is the ſame as, p. 341, *Convolvulus ſpecioſus* of Linn. Suppl.

Page 345. *Ipomoea palmata* of Forſkâhl is *Convolvulus Cairicus*, p. 342. See Vahl, ſymb. 1. p. 15.

Ipomoea biloba of Forſkâhl is *Convolvulus Pes capræ*, p. 344, as I know from a ſpecimen of Forſkâhl's in Sir Joſeph Banks's herbarium.

Ipomoea aquatica of Forſkâhl is *Convolvulus repens*, p. 343. See Vahl, ſymb. 1. p. 17.

Page 354. *Roëlla reticulata* has no other authority for its exiſtence than Petiver's figure, and his calling it a Campanula; but on comparing this figure with *Gorteria ciliaris*, it is clear that it repreſents that plant without flowers.

Page 356. *Lobelia ſurinamenſis*, and *Lobelia lævigata*, are the ſame.

Lobelia

Lobelia bulboſa, *Lobelia Cyphia*, p. 357, Lobelia bulboſa Linn. Suppl. and, p. 370. *Cyphium capenſe*, Cyphia bulboſa of Bergius, are the ſame; which I could eaſily tell, even if I did not know the plant, as Bergius quotes Linn. ſp. pl. and the younger Linné quotes Bergius, though he has forgot to refer to his father's writings. In the figure of Burmannus, quoted for Lobelia bulboſa, the Editor has copied the error of preſs in the ſpecies plantarum, (fig. 1. inſtead of 2.) without attending that he in the following page refers the ſame figure to L. coronopifolia, which it is.

Page 357. *Lobelia comoſa* remains here as a ſpecies, though it is taken up in the foregoing page as a variety β. of *Lobelia triquetra.*

Page 358. *Lightfootia oxycoccoides* and *ſubulata* of L'Heritier are here joined with the genus of Lobelia, from which they are very diſtinct; and again, in p. 826, they are taken up under Swartz's genus of Lightfootia, to which they have not the ſmalleſt affinity.

Page 359. *Rondeletia biflora* of Rottböll is the ſame as, p. 334. *Virecta biflora* of Linn. Suppl.

Page 366. *Hamellia ventricoſa* of Swartz, and *Hamellia grandiflora* of L'Heritier, are the ſame.

Page 368. *Lonicera media* of Murray, known in the Engliſh gardens under the name of L. glauca, is the *Lonicera dioica* of Linné, as appears from his herbarium.

Page 371. *Morinda muſcoſa* of Jacquin remains here in the genus Morinda, though the Editor has taken it up, p. 372, as *Cephælis muſcoſa* from Swartz.

Page 373. *Lignonia* of Scopoli is, by his own account, *Paypayrola* of Aublet, which the Editor has taken up under that name, p. 419.

Page 382. *Physalis limensis* of Retzius, I have no doubt, from the description, of being the same as, p. 381. *Physalis prostrata* of L'Heritier; but how the latter came in the division of Perennes, I cannot tell. The first words in L'Heritier's description are: "Planta annua."

Page 385. *Solanum ægyptiacum* of Forskâhl is *Solanum nigrum* γ *villosum* of Linn. according to Vahl, symb. 2. p. 40.

Solanum memphiticum, Forsk. p. 46. n. 51. is, by Professor Vahl, loc. cit. referred to *Solanum nigrum* as a new variety η *hirsutum*.

Solanum incanum of Forskâhl is *Solanum sanctum*, p. 386. See Vahl, symb. 2. p. 41.

Page 387. *Strychnos potatorum* of Linn. Suppl. and *Strychnos Tetankotta* of Koenig and Retzius, are the same. Tetan-kottæ, which is probably the Tamul name of this tree, is quoted in the former place.

Page 389. *Lycium japonicum* of Thunberg, and *Lycium fœtidum* of Linn. Suppl. are the same; but more properly taken up as a distinct genus by Jussieu under the name of Seriſſa, by L'Heritier called Buchozia, and by Loureiro, Dysoda.

Lycium heterophyllum of Murray is the same as Lycium boerhaviæfolium of Linn. Suppl. which the Editor has taken up, p. 393, under L'Heritier's name of *Ehretia halimifolia*. By a strange error of the press, the name which ought to follow the quotation, Suppl. p. 150, is to be found in the following page, between n. 6. and n. 7.

Page 390. *Placoma pendulum*, and, p. 428. *Plocama pendulum*, is the same plant of Hort. Kew. taken up twice, with a small variation in the generic name, probably only from an error of the press.

Page 391. *Vallaris indica*, Vallaris pergulanus of Burmannus, is *Pergularia glabra*, p. 440.

Meiſteria anonyma, Barreria of Scopoli, n. 767, (miſprinted 868.) is *Poraqueiba guianenſis* of Aublet; and though the Editor has taken the character eſſentialis, not from Scopoli, but from Aublet's generic deſcription, he ſtill has the ſame plant, in p. 331, under Aublet's name.

Page 392. *Chironia dodecandra* of Walter is meant for C. dodecandra of Species plant. as the trivial name is not printed in italics; and then it is *Chlora dodecandra*, p. 618.

Page 398. *Rhamnus pentaphyllus*, firſt publiſhed by Linné, under the name of Rhamnus ſiculus, in the Appendix to the 3d tom. of the Syſtema Naturæ, 12th edition, is the Argan or Olive-tree of Morocco (ſee Höſts efterretninger om Marokos, p. 284): as appears from the ſpecimen in Linné's herbarium, which has a ticket affixed with the name of Argan of Morocco, and which I have alſo compared with ſpecimens in Sir Joſeph Banks's herbarium from Morocco. From Clifford's herbarium, now in the poſſeſſion of Sir Joſeph Banks, it alſo appears, that the Argan was already taken up by Linné in the Hortus Cliffortianus, under the name of *Sideroxylum ſpinoſum*, though moſt of the ſynonyms are wrong, and conſequently the locus natalis, which is taken from them. The ſpecimen in Linné's herbarium, under the name of Sideroxylum ſpinoſum, is without flowers, and ſuch that it is impoſſible to tell with any certainty what it is; Clifford's herbarium is therefore the only authority by which this ſpecies can be aſcertained. Rhamnus ſiculus pentaphyllos of Boccone, which is quoted as a ſynonym for the firſt, is a very different plant, having really folia quinata, and conſequently not at all likely to belong to either of theſe genera. The ſpecimen which Jacquin has deſcribed in his Obſ. Bot. is now in Sir Joſeph Banks's herbarium; but having no flowers, only fruit, it is impoſſible to determine it.

Page 399. The ſpecimen in Linné's herbarium, from which the differentia ſpecifica of *Rhamnus micranthus*, and the deſcription in Amœn. Academ. were made, is *Boehmeria ramiflora*, p. 267; but the ſynonyms belong to a ſpecies of Celtis, taken up in Swartz's prodr. under the name of micrantha.

Rhamnus ellipticus of Swartz and Hort. Kew. and, p. 402, *Ceanothus reclinatus* of L'Heritier, are the ſame; and the Editor quotes the ſame figure of Browne for both.

Page 403. *Mæſa* of Forſkâhl is the ſame genus as, p. 370. *Bæobotrys* of Forſter; Forſkâhl's plant is called by Vahl, ſymb. 1. p. 19. Bæobotrys lanceolata.

Page 408. *Rubentia* of Commerſon and Juſſieu is the ſame as, p. 417. *Elæodendrum* of Jacquin.

Page 409. *Dioſma unicapſularis* of Linn. Suppl. is the ſame as, p. 268. *Empleurum Aitoni*, Empleurum ſerrulatum of Hort. Kew.

Dioſma odoratiſſima of Montin, and *Dioſma latifolia* of Linn. Suppl. are the ſame.

Page 418. There is no reaſon to ſuppoſe that *Mangifera Amba* of Forſkâhl is different from *Mangifera indica*, in which Jacquin has found the ſtamina ſuch as Forſkâhl deſcribes them in Amba. See ic. vol. 2. and collect. 4. p. 97.

Page 422. *Loghania* of Scopoli, n. 1076, (miſprinted 1476,) is, by his own account, Souroubea of Aublet, and conſequently *Ruyſchia Surubea*, p. 407.

So far I had written when I received the firſt part of the firſt volume of the Tranſactions of the Society of Natural Hiſtory of Paris, in which M. Lamarck has given a memoire on this ſubject; but not having had leiſure to examine this edition thoroughly, the

the instances he gives of these duplications and triplications of genera and species, are not so many as they would have been, if he had extended his researches farther. My first intention, on perusing M. Lamarck's observations, was to leave out in this paper all the instances given by him; but, considering that our Society's Transactions may fall into the hands of many who have not so easy an opportunity of seeing the French Acts, I shall pursue my plan in the same manner as I have begun it, and have also added, in notes to the former part of this paper, three instances from M. Lamarck, which had escaped my observation.

Page 424. *Achyranthes villosa* of Forskâhl is *Illecebrum lanatum*, p. 426. See Vahl, symb. 1. p. 22.

Page 430. *Anguillaria* is the same genus as *Ardisia*, p. 394, and *Anguillaria bahamensis* and *Ardisia excelsa* are the same plant; but Dr. Gærtner has made a mistake in the trivial name, this tree being a native of the island of Madeira, and not of the Bahama Islands. Bacca infera given as specific difference to the Anguillaria zeylanica of Gærtner, by the Editor, is so ridiculous a mistake that I can no way account for it.

Page 433. *Cerbera parviflora* of Forster is the same as, p. 439. *Ochrosia borbonica*, as I learnt by the comparison of a specimen from Forster in Sir Joseph Banks's herbarium, with a specimen of Commerson's in the possession of Mr. Viborg; but Ochrosia maculata of Jacquin's Icones & Collectanea is probably a different species, having lanceolate leaves, longer and narrower than those of Cerbera parviflora.

Page 434. *Gardenia jasminoides* of Retzius, and *Gardenia scandens* of Thunberg, are the same. M. Lamarck makes, in his memoire, an observation, that Gardenia spinosa and dumetorum are the same; and he is very right that G. spinosa of Linn. Suppl. is

the ſame as G. dumetorum of Koenig and Retzius; but I am inclined to believe that G. ſpinoſa of Thunberg, from China, is a different ſpecies, having the calyx externally, and the germen very hairy, which both are ſmooth in the former.

Page 439. *Amſonia Tabernæmontana* of Walter is certainly meant for *Tabernæmontana Amſonia* of Linné, as the trivial name is printed in Roman character; and I think it highly probable that his *Amſonia ciliata* is the ſame as *Tabernæmontana anguſtifolia* Hort. Kew.

Page 441. *Cynanchum cordifolium* of Koenig and Retzius is the ſame as, p. 442, *Cynanchum extenſum* of Jacquin.

Page 444. *Aſclepias cordata* of Forſkâhl is *Pergularia tomentoſa*, p. 440; but the deſcription in Linn. Mant. 53. does not belong to the ſame plant, as may eaſily be ſeen by comparing it with the differentia ſpecifica; nor is the ſynonym of Burmannus properly referred to it. See Vahl, ſymb. 1. p. 23.

Page 445. *Aſclepias repanda* is, if I am not miſtaken, the ſame as *Aſclepias criſpa*.

Page 453. *Salſola monobractea* of Forſkâhl, and *Salſola muricata* of Linn. Mant. are the ſame. See Vahl, ſymb. 1. p. 24.

Salſola mucronata of Forſkâhl is the ſame as, p. 454. *Anabaſis ſpinoſiſſima* of Linn. Suppl. See Vahl, loc. cit.

Page 454. *Steris javana* is the ſame as *Nama zeylanica*, p. 457.

Page 463. *Vahlia capenſis* of Thunberg is the ſame as *Ruſſelia capenſis* Linn. Suppl.

Page 477. *Peucedanum minus* is the ſame as *Pimpinella dioica*, p. 492.

Page 483. *Sium ninſi* is taken up only from Kæmpfer's figure, which certainly repreſents *Sium Siſarum*; and it is to be ſuppoſed that the Japaneſe had been impoſed upon by the Chineſe, to take this

this for the plant which furniſhed the Ginſeng, as we know by the figure drawn by Father Jartoux, on the ſpot where this famous root is collected, that it is the root of Panax quinquefolium. See his figure in the tenth volume of Lettres Edifiantes, copied from thence in the Philoſophical Tranſactions, vol. 28. tab. 5. and in Deſcription de la Chine par du Halde, folio edition, vol. 2, at page 154.

Page 484. *Siſon ſalſum* of Linn. Suppl. is the ſame as, p. 477. *Peucedanum redivivum* of Pallas.

Page 499. *Tamarix orientalis* of Forſkâhl is the ſame as *Thuja aphylla*, p. 1006. See Vahl, ſymb. 2. p. 48.

Page 502. *Paſſiflora ſtipulata* of Aublet, is probably the ſame as *Paſſiflora glauca* of Hort. Kew. In Aublet's own herbarium is no ſpecimen of his plant, ſo that it cannot be aſcertained with certainty; but a ſpecimen in Sir Joſeph Banks's herbarium, collected in Cayenne by Mr. von Rohr, which I think very likely to be Aublet's plant, has ſtipulæ ſemicordatæ, as the P. glauca of Hort. Kew. even more rounded than the loweſt ſtipulæ in Aublet's figure, and not ſemi-ſagittatæ, as the upper ones in the ſame figure.

Page 511. *Statice aphylla* of Forſkâhl is the ſame as *Statice pruinoſa*. See Vahl, ſymb. 1, p. 26.

Page 515. *Schranckia quinquefaria*, Scop. introd. *g.* 1334, has given me more trouble than any other of the frequent miſtakes of the Editor. No Schranckia is in Scopoli, and 1334 is an error of the preſs. After ſeveral fruitleſs attempts to find this genus, I had at laſt the patience to examine every genus in Scopoli which is not taken from Linné, and from this inveſtigation I found that it could be no other genus than 1043, Goupia of Aublet, though the Editor has given a falſe character of the fruit, from miſunder-

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ſtanding Aublet's figure. Goupia is before taken up, in p. 510, under Schreber's name of *Gloſſopetalum*.

Wiſenia indica, Viſenia umbellata of Houttuyn, is the ſame as, p. 1011. *Melochia odorata* of Forſter and Linn. Suppl.

Page 520. *Eracliſſa hexagyna* of Forſkâhl, and, p. 597, *Limeum humile* of Forſkâhl, are the ſame as *Andrachne telephioides*, p. 504. See Vahl, ſymb. 2. p. 99.

Schefflera of Forſter is the ſame genus as *Aralia*, p. 509.

Page 531. *Hepetis anguſtifolia* of Swartz is the ſame as, p. 530. *Pitcarnia bromeliæfolia* of L'Heritier.

Page 532. *Lachenalia mediana* of Jacquin, and *Lachenalia pallida* of Hort. Kew. are the ſame.

Page 533. *Tradeſcantia ſpathacea* of Swartz, and *Tradeſcantia diſcolor* of L'Heritier, are the ſame.

Page 537. *Crinum obliquum* of Linn. Suppl. is the ſame as, p. 538, *Timmia obliqua*, Cyrtanthus obliquus of Hort. Kew. And the Editor quotes the ſame figure of L'Heritier for both, though in the former quotation is an error of the preſs, 15 inſtead of 16. (Tab. 15. is Amaryllis aurea, for which it is quoted in p. 539.)

Page 538. *Crinum anguſtifolium* of Linn. Suppl. is the ſame as *Timmia anguſtifolia*, Cyrtanthus anguſtifolius of Hort. Kew.

Amaryllis capenſis is certainly the ſame as *Hypoxis ſtellata*, p. 548.

Page 547. *Enargea marginata* of Solander and Gærtner is the ſame as, p. 556. *Callixene* of Commerſon and Juſſieu.

Page 550. *Ornithogalum caudatum* of Jacquin is the ſame as O. caudatum of Hort. Kew. which the Editor has taken up, in p. 551, under the name of *Ornithogalum Maſſoni* (miſprinted *Malſoni.)*

Ornithogalum flaveſcens and *Ornithogalum miniatum* of Jacquin ſeem to me to be only varieties, differing in nothing but the colour of the flowers. The differentia ſpecifica which the Editor has given

of the former is erroneous; for longioribus muſt be read brevioribus.

Page 551. *Ornithogalum crenulatum* of Linn. Suppl. and *Ornithogalum unifolium* of Retzius, I take to be the ſame.

Page 556. *Leontice leontopetaloides* is certainly the ſame as, p. 767. *Tacca pinnatifida.*

Page 558. *Dracæna medeoloides* of Thunberg is the ſame as, p. 588. *Medeola aſparagoides.*

Page 561. *Hyacinthus lanatus* is the ſame as, p. 560. *Argolaſia* of Juſſieu, or Lanaria plumoſa of Hort. Kew.

Phormium bulbiferum of Cirillo is the ſame as, p. 532. *Lachenalia pendula* of Hort. Kew.

Page 562. *Aletris japonica* of Thunberg, in Nova Acta Societatis Scientiarum Upſalienſis, is the ſame as, p. 565. *Hemerocallis japonica* of Thunberg's Flora japonica.

Pag 570. *Virola ſebifera* of Aublet is before taken up, in p. 11. from Swartz prodr. under the name of *Myriſtica ſebifera.*

Page 573. *Achras ſalicifolia* occurs before in p. 398, under Swartz's name of *Bumelia ſalicifolia.*

Page 579. *Bambus*, Bambos of Retzius, Bambuſa of Schreber, is probably the ſame genus as, p. 580. *Naſtus* of Juſſieu.

Page 580. *Manſana arborea*, Manſſanas of Sonnerat, is the ſame as *Rhamnus Jujuba*, p. 401. See Lamarck in Act. Soc. Hiſt. Nat. Pariſ. 1. p. 83.

Page 587. *Wurmbea capenſis* of Thunberg is the ſame as, p. 588. *Melanthium monopetalum* of Linn. Suppl.

Page 596. *Dracontium cordatum* of Aublet is the ſame as, p. 275. *Pothos macrophylla* of Swartz.

Page 609. *Heinzia* of Scopoli is *Coumarouna* of Auble, p. 1084. Baryoſma Tongo of Gærtner.

Porteſia ovata of Cavanilles is the ſame as, p. 679. *Trichilia pallida* of Swartz.

Page 610. *Trigonis tomentoſa* of Jacquin, and *Cupania tomentoſa* of Swartz, are the ſame.

Page 611. *Euphoria* of Juſſieu, p. 612. *Scytalia* of Gærtner, and, p. 635, *Litchi* of Sonnerat, are the ſame genus; and if the Editor by Euphoria ſinenſis means the Litchi, they are all the ſame ſpecies; but as M. Juſſieu mentions both Litchi and Longan as ſpecies of his genus of Euphoria, I cannot poſſibly gueſs which of the the two the Editor meant. In a future edition of the Syſtema Vegetabilium we may expect this famous Chineſe fruit to make a fourth genus, under Loureiro's name of Dimocarpus.

Molinæa of Commerſon and Juſſieu is the ſame genus as, p. 610. *Cupania*. See Lamarck in Act. Soc. Hiſt. Nat. Pariſ. 1. p. 84. M. Lamarck makes in the ſame place an obſervation relative to the Jambolifera pedunculata, p. 613. that it is icoſandrous, and not generically different from Eugenia. The Jambolana of Rumphius certainly belongs to the claſs Icoſandria, and ſtrictly ſpeaking to the genus of Calyptranthes of Swartz; but the plant which Linné deſcribed, from Hermann's herbarium, in Flora Zeylanica, n. 139, under the name of Jambolifera, is a very different plant, noways related to the family of Myrti. Mr. Schumacher was the firſt who pointed out to me the true Jambolifera pedunculata Linn. in Sir Joſeph Banks's herbarium, ſent by Dr. Koenig under the name of Myrtus cumini, octandra monogyna, flore infero; and he informed me, that Profeſſor Rottboell had compared this plant, ſent to him by Dr. Koenig under the ſame name, with the ſpecimen of Jambolifera pedunculata in Hermann's herbarium, now in the poſſeſſion of Count Moltke, and found them to be the ſame. The only way I can account for this confuſion is to ſuppoſe that

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in Hermann's herbarium, the tickets of Madan and Ankænda had by ſome accident been changed, and Linné thereby induced to give the name of Jambolifera to Ankænda, believing it to be the tree which bears the Jamboloins of Acoſta. Dr. Koenig again, who ſeems to have made out the plants in Linn. Fl. Zeylan. almoſt entirely by the Cingaleſe names, ſent this plant by the name of Myrtus cumini, as the name of Ankænda is in Fl. Zeylan. aſcribed to Myrtus, n. 185. (cumini); and he ſent the Jambolana (Madan Cingal.) under the name of Jambolifera pedunculata. The fruit of Ankænda is deſcribed by Dr. Gærtner under the name of Cyminoſma; but his firſt ſpecies, tab. 58. fig. *a*—H, cannot be the ſame with Dr. Koenig's, as the petals are nearly of the ſame length with the calyx: the other ſpecies, which Gærtner deſcribes with petals three times the length of the calyx, may perhaps be the ſame as Dr. Koenig's plant, and if ſo, it is figured in Rheed. Mal. 5. tab. 15. which figure agrees tolerably well with Dr. Koenig's ſpecimen in regard to flowers and leaves, and as to fruit with Gærtner, tab. 58. fig *i*. For further elucidation of this genus, which has been the ſubject of ſo much confuſion, I take the liberty of introducing here, from Koenig's manuſcripts vol. 17. p. 189 (in Sir Joſeph Banks's library), his deſcription of the flower, made in Ceylon from the living plant.

"*Calyx* tetraphyllus: *foliola* orbicularia, patentiſſima, glabra, viridia, longitudine vix baſin floris æquantia: duo minora. *Petala* quatuor, lanceolata, patenti-recurvata, canaliculata, acuta, ſubunguiculata, viridi-albicantia, floribus Pavettæ ſimillima habitu & magnitudine. *Filamenta* octo, alterna receptaculo, alterna petalorum baſi adnata, patentia, lanceolato-linearia, plana baſi piloſa, petalis breviora & concolora. *Antheræ* oblongæ, verſatiles. *Germen* nectario carnoſo, elevato, octangulari, piloſo, luteo adnatum, ovatum, tomentoſum. *Stylus* erectus, glaber, ſtamnibus brevior,

viridis. *Stigma* ſubcapitato-conicum, glabrum, ſulculis notatum."

The four ſtamina, which alternate with the petals, have no doubt been taken for petals by Dr. Gærtner, who counts eight petals perſiſtent below the fruit.

Page 614. *Amyris ambroſiaca*, and, p. 619, *Icica heptaphylla*, are the ſame; and the ſame figure of Aublet is quoted for both.

Page 615. *Binectaria* of Forſkâhl is the ſame as *Mimuſops Kauki* (miſprinted Kanki), p. 612. See Vahl, ſymb. 1. p. 27.

Page 618. *Mindium* of Juſſieu, and *Michauxia nova*, Michauxia campanuloides of L'Heritier and Hort. Kew. are the ſame.

Page 629. *Heymaſſoli* of Aublet is the ſame genus as *Ximenia*, p. 615. See Juſſ. gen. 260, and Lamarck in Act. Soc. Hiſt. Nat. Paris, 1. p. 84. Heymaſſoli ſpinoſa is probably not different from Ximenia americana; the ſpecimen in Aublet's own herbarium, now in the poſſeſſion of Sir Joſeph Banks, is ſo bad, that nothing can be inferred from it; but in a better ſpecimen, collected by Mr. Alex. Anderſon in the Dutch Guiana, and ſent under Aublet's name, I can find no diſtinguiſhing marks. Of Heymaſſoli inermis is no ſpecimen in Aublet's herbarium, and as there is no figure and no deſcription of it, it is truly an unknown plant.

Page 633. *Quiviſia* of Juſſieu is the ſame genus as Quiviſia of Cavanilles, which the Editor has taken up under the name of *Gilibertia*, p. 682.

Page 634. *Paſſerina ciliata*, as it now ſtands in Reichards's edition of the Syſtema Plantarum, contains at leaſt three different plants. As there is no ſpecimen in Linné's herbarium with this name, the plant which he meant can only be aſcertained by Clifford's herbarium, from which he originally deſcribed it. On examining this herbarium, I found on the paper which repreſents

Paſſerina 2. Hort. Cliff. four different Cape plants paſted; but the one to which the deſcription in Hort. Cliff. applies, is *Struthiola virgata*, p. 277. Linné adds to his deſcription, "Me hic dubia propoſuiſſe ſynonyma Lectorem moneo, ob figuras & deſcriptiones imperfectas." Among theſe doubtful ſynonyms is the Sanamunda I. Cluſii, on whoſe authority Spain is given as the native place of this plant; this wrong ſynonym and falſe locus natalis have no doubt led the Spaniſh botaniſts to look for Paſſerina ciliata in their country. The ſpecimen in Sir Joſeph Banks's herbarium, ſent from Spain by Profeſſor Ortega, under this name, has not properly ciliated leaves, but they are thinly covered with hairs. If Rauwolf's plant in Gronovii Flora Orientalis is the ſame as the Spaniſh plant, can only be determined by thoſe who have an opportunity of examining Rauwolf's herbarium at Leyden. Bergius's plant is from the deſcription evidently different from either of the above mentioned.

Paſſerina Metnan of Forſkâhl (miſprinted Metkan) is *Paſſerina hirſuta*. See Vahl, ſymb. 1. p. 29.

Page 635. *Tondin* of Schilling is *Paulinia pinnata*, p. 642.

XVIII. *Remarks on Centaurea ſolſtitialis and C. melitenſis.* By *James Edward Smith, M. D. F. R. S. P. L. S.*

Read October 2, 1792.

THE plant intended by Mr. *Hudſon* in his *Flora Anglica*, edition 2, p. 377, by the name of *Centaurea ſolſtitialis*, has never been well aſcertained. It is ſaid in Ray's Synopſis to have been found, by Mr. *Bobart*, about hedges in the neighbourhood of Cirenceſter in Glouceſterſhire; and Mr. *Hudſon* adds Northfleet in Kent as another place of its growth, probably from his own knowledge, as he quotes no authority.

What is commonly preſerved in our Engliſh gardens and herbariums under the name of *Centaurea ſolſtitialis*, and taken for the plant of Ray and Hudſon, I diſcovered, on receiving the Linnean herbarium, to be the *C. melitenſis* of our great maſter. I always, from that time, ſought every opportunity of determining which of the two ſpecies ought really to be conſidered as belonging to our Engliſh Flora, but long without ſucceſs, having never been able to ſee any undoubtedly wild ſpecimens.

When in Languedoc, in the winter of 1786, I there gathered the Linnean *C. ſolſtitialis*, and brought its ſeeds to the garden of

my worthy friend, Dr. *Gwyn*, at Ipſwich, where ſeveral of the plants came up and flowered. This ſpecies was never, to the beſt of my knowledge, ſeen in an Engliſh garden before, at leaſt not in modern times.

On viſiting Mr. Crowe, F. L. S. at Lakenham, this ſummer, he to my great ſurprize ſhewed me a recent wild ſpecimen of the real *C. ſolſtitialis*, gathered by himſelf in a graſſy field at Arminghall, about two miles from Norwich, in a gravelly ſoil, where he aſſured me he had obſerved it for ſeveral years undoubtedly wild. Mr. Crowe himſelf did not conſider this as a very important diſcovery, not recollecting that there was any difference between the plant he had gathered at Arminghall, and that we uſed to have in our gardens about Norwich ten or twelve years ago, the two ſpecies being indeed much alike at firſt ſight. If indeed they had been the ſame, it might have been ſuppoſed that ſeeds had eſcaped from a garden, and planted themſelves, or been intentionally ſown, in the field above mentioned. But as the true *C. ſolſtitialis* has never been in any garden, in this neighbourhood at leaſt, except Dr. Gwyn's forty miles diſtant, and that not till the year 1788, I have no doubt that this ſpecies is really wild at Arminghall. Whether it may have been in former times introduced among corn from abroad, I cannot tell; it now grows among ſhort graſs, with all the appearance of a wild plant; nor are the farmers here in the habit of importing ſeed from abroad.

It remains therefore to be examined whether *C. melitenſis* be likewiſe a native of our iſland or not. Perhaps the old herbariums in the Britiſh Muſeum may throw ſome light on this ſubject*, or the places of growth mentioned by Ray and Hudſon may ſtill afford the plant they intended.

* I have ſince examined them without obtaining any poſitive ſatisfaction.

The

The two ſpecies are eaſily diſtinguiſhed by the following marks:

C. ſolſtitialis has the lobes of the leaves acute, and eſpecially the terminal one, which is perfectly deltoid. The ſcales of the calyx are each terminated by a very ſtrong pale yellow ſpine, half an inch in length, accompanied by ſeveral ſmaller ones.

C. melitenſis on the contrary has all the lobes of its leaves rounded, and the terminal one remarkably ſo, and perfectly blunt, even retuſe. The calyx is fringed with ſmall browniſh ſpines, of which the longeſt is not above one-third the length of *C. ſolſtitialis*.—Both ſpecies have bright yellow flowers.

The figure in Gerarde's Herbal, the ſecond edition, p. 1166, is added by Johnſon, and repreſents the true *C. ſolſtitialis* very well.

Norwich, Sept. 28.
1792.

XIX. *De-*

XIX. *Deſcription of Fucus daſyphyllus. By Thomas Jenkinſon Woodward, Eſq. F. L. S.*

Read Oct. 2, 1792.

FUCUS DASYPHYLLUS. Tab. 23, f. 1.

F. fronde cartilagineâ ramoſiſſimâ; ramis filiformibus ſubſimplicibus, foliis cylindricis obtuſis baſi attenuatis ſparſis.

Deſc. THE frons is bright red, cartilaginous, but conſiderably gelatinous and tender, pellucid, from four to ſix inches high; divided immediately from the root, which is not fibrous but diſcoid, into very numerous branches; theſe are either ſimple or again ſlightly branched, filiform, the ſize of ſmall pack-thread, terminating in a blunt point. The lower part of the branches nearly naked; the upper clothed, but not very thickly, with leaves growing without order, from one to four lines long, and about half a line broad, the longeſt below, and growing gradually ſhorter as they approach the upper part of the branch; cylindrical, terminating in a blunt point, and very much attenuated towards their inſertion; in ſubſtance very tender and gelatinous, of a paler red than the branches, and ſometimes tinged with green. Some of

theſe

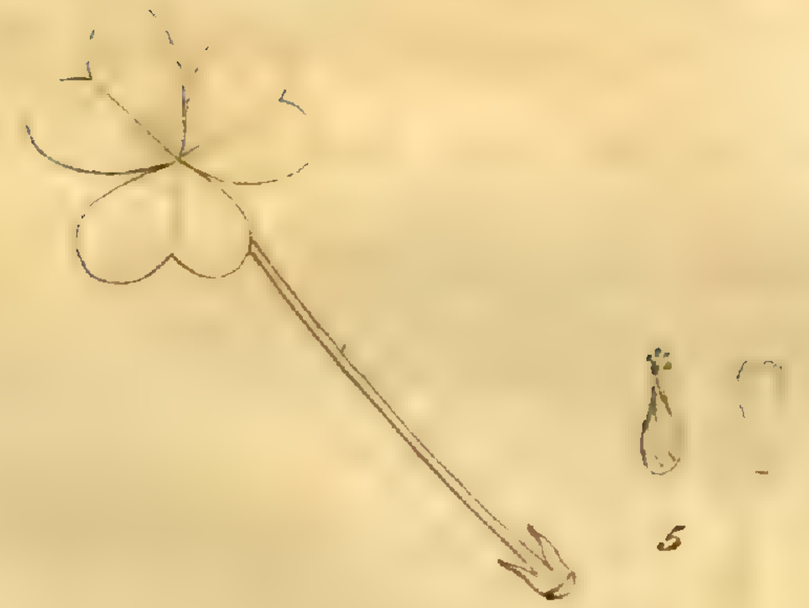
theſe leaves are proliferous, having others more minute growing from their ſides.

The fructification conſiſts of minute ſeſſile tubercles, numerous, but placed without order on the lower part of the principal branches, and ſometimes, but rarely, on the leaves; dark red, ſo ſmall as ſcarcely to be diſtinguiſhed by the naked eye, unleſs the plant be moiſtened, but eaſily diſcernible with a common eye-glaſs.

The whole plant has ſomewhat of a granulated appearance, which, added to the gelatinous nature of the frons, has occaſioned it to be ſuppoſed an Ulva; but this appearance is fallacious, the granulations under the microſcope proving to be nothing more than the ſubſtance of the frons, in this reſpect agreeing with *Fucus rubens*, which ſubmitted to the ſame examination has a ſimilar appearance.

This *Alga* was firſt found a few years ſince, waſhed up by the tide at Yarmouth, by Mr. L. Wigg, an aſſociate of this Society; and was then pronounced, by a highly reſpectable botaniſt, to be the *Ulva filiformis* of *Hudſon;* but it does not accord with the ſpecific character of that plant in the *Flora Anglica*, and whether it be at all deſcribed in that work ſeems very doubtful. At any rate the fructification, conſiſting of diſtinct tubercles totally projecting from the ſubſtance of the frons, ſufficiently point it out to be a Fucus.

Its place in the Syſtem is next to *Fucus ovalis* (Fl. Ang.), which, in the ſubſtance of the frons, and form and diſpoſition of the leaves, it conſiderably reſembles, conſequently in the ſubdiviſion, '*foliis diſtinctis;*' but as it is evident that both theſe plants have fleſhy leaves, not differing in ſubſtance from the reſt of the frons, they



5

O. pusilla, p. 243.

4

O. ambigua, p. 242.

1

3

2

Fucus dasyphyllus

they ought rather perhaps to be placed in the ſubdiviſion '*fronde tereti.*'

ENGLISH NAME. Thick-leaved Fucus. Duration.?

HAB. *Cromer on the coaſt of Norfolk.*—The fructification firſt diſcovered by Mr. Wigg, on a ſpecimen found on the beach at Yarmouth in June 1792.

TAB. 23.

Fig. 1, repreſents the whole plant.
2, a branch in fructification.
3, the ſame magnified.

XX. *The Characters of Two Species of Oxalis. By Richard Anthony Salisbury, Esq. F. R. S. and F. L. S.*

Read Oct. 2, 1792.

IN making a catalogue of the plants in my garden, having had lately occasion to investigate several *Oxalides*, the result of my enquiries respecting two species, which many botanists have thought only varieties, may possibly be interesting enough to be laid before the Linnean Society.

OXALIS AMBIGUA. Tab. 23. f. 4.

O. caule repente; foliis 3-natis; petiolis *semiteretibus, exstipulatis*; laminis emarginatis: corollæ laciniis *obovatis integerrimis*: stylis altitudine filamentorum longiorum, *patulis*.

Oxalis corniculata. *Berg. Phyt. v.* 2. *p.* 17. *cum Ic.* Oxalis corniculata. *Muller, in Fl. Dan. fasc.* 15. *p.* 4. *f.* 873. Oxalis stricta. *Linn. Sp. Pl. ed.* 2. *p.* 624. Oxys lutea americana. *Dill. Hort. Elth. p.* 299. t. 221. f. 4.

THOUGH the primary stems of this plant in some degree answer to the definition which *Linné* has given of the term *strictus*,

ſtrictus, yet the branches, which break out near the root, are conſtantly creeping, as in the following—There is, however, even in this reſpect, an obvious difference between them to the eye, but it is not eaſy to be conciſely expreſſed in botanic language; and fortunately there is no neceſſity to have recourſe to it for a ſpecific character.

OXALIS PUSILLA. TAB. 23. f. 5.

O. caule repente: foliis 3-natis; petiolis *teretiuſculis, baſi ſtipulatis*; laminis emarginatis: corollæ laciniis *obcuneiformibus*, apice *eroſulis*: ſtylis vix altitudine filamentorum longiorum, faſtigiatis.

Oxalis corniculata. *Linn. Sp. Pl. ed.* 2. *p.* 623. Trifolium acetoſum corniculatum. *Bauh. Pin. p.* 330. Oxys flavo flore. Cluſ. *Hiſt. Pl. lib.* 6. *p.* 248. *cum Ic.*

THE older botaniſts, regarding this plant as a ſpecies of *Trifolium*, gave it the ſpecific epithet of *corniculatum*, from the figure of the ſeed-veſſel, which in the preſent improved ſtate of the ſcience is very indefinite, being equally applicable to the whole genus. Above are all the ſynonyms I dare at preſent ſay certainly belong to it. It is perennial, but liable to be deſtroyed by ſevere froſt, and always of much dwarfer growth than the former. I received the ſeeds of it from *Spain*, and it is alſo found wild occaſionally in *Devonſhire*; a certain proof of the mildneſs of that climate, where many other ſouthern plants occur, ſuch as *Pinguicula luſitanica*, *Sibthorpia europæa*, *Lobelia urens*, and *Erica vagans*. This circumſtance, together with that of the *Arbutus Uedo* and *Andromeda Dabeocii*, which laſt grows alſo in *Teneriffe*, being found wild in *Ireland*, ſeems to ſtrengthen the conjecture, that ſome violent concuſſion of the

globe has formerly removed theſe plants from warmer latitudes. The ſoil in which the above-mentioned plants ſeverally are found, and the ſtructure of their ſeeds, render it exceeding improbable that the ſea ſhould have tranſported them. To future geologiſts, who may have other data to aſcertain ſo very doubtful a matter, poſſibly the facts recorded by the humble botaniſts of the preſent age may be of no ſmall conſequence, and ſerve, among many others, to reſcue their labours from that reproach of inutility which is too often thrown upon them by thoſe who are fooliſh.

XXI. *De-*

XXI. *Description of a New Species of Warbler, called the Wood Wren, observed in May* 1792. *By Mr. Thomas Lamb, A. L. S.*

Read Nov. 6, 1792.

THE length is five inches and a half; bill horn-colour; upper mandible bent at the tip, and rather longer than the under; irides hazel; noſtrils beſet with briſtles; top of the head, neck, back and tail coverts olive-green; throat and cheeks yellow, paler on the breaſt; belly and vent of a moſt beautiful ſilvery white; through the eye paſſes a yellow line; wings and coverts brown, edged with green; the tail conſiſts of twelve feathers, rather forked, and of a brown colour, edged with green on the exterior webs, and with white on the interior, the firſt feather wanting the green edge; under part of the ſhoulder bright yellow; legs rather more than an inch long, of a horn-colour; claws paler.

This is undoubtedly a new ſpecies in England, and I believe a non-deſcript: it inhabits woods, and comes with the reſt of the ſummer warblers, and in manners is much the ſame, running up and down trees in ſearch of inſects.

I heard it firſt, early in May, in Whitenight's Park, near Reading; it was there hopping about on the upper branch of a very high pine, and having a very ſingular and ſingle note, it attracted my attention, being very much like that of the *Emberiza Miliaria* (Linn.), but ſo aſtoniſhingly ſhrill that I heard it at more than a hundred yards diſtance: this it repeated once in three or four minutes.

I never

I never heard theſe birds before laſt ſpring, and nevertheleſs I have heard nine in the courſe of a month; four in Whitenight's Park, and five in my tour to the Iſle of Wight, viz. one in a wood at Stratfield Sea. one at Eaſt-Stratton Park, two in the New Foreſt, and one in a wood near Highclere: I have not heard it ſince June 6. Colonel Montague informed me he had met with it in Wiltſhire, and had called it the Wood Wren; it has alſo been heard near Uxbridge.

It differs from the *Motacilla Hippolais* (Linn.), in being much larger, of a finer green colour on the upper parts, and more beautiful white beneath; alſo in the yellow ſtreak paſſing through the eye, which in the *Hippolais* paſſes above and below the eye. It differs alſo from the *Motacilla Trochilus* (Linn.), in being larger, and white on the under parts, which are yellow in the *Trochilus*. The three which I opened were all males: I ſhall ſtill continue my reſearches for the female with the neſt and eggs; and if I ſhould at any time meet with them, I ſhall with pleaſure ſubmit my obſervations to the Linnean Society.

TAB. 24. exhibits the Wood Wren of its natural ſize.

Linn. Trans. II. tab. 24. p. 246.

Wood Wren

XXII. *Obſervations upon the Structure and Oeconomy of thoſe Inteſtinal Worms called Tæniæ. By Mr. Anthony Carliſle, F. L. S.*

Read Nov. 6, 1792.

THE following obſervations are offered to the Linnean Society, as an attempt to explain the mechaniſm and phyſiology of a very ſimply-conſtructed animal.

How far ſuch inveſtigations will aſſiſt in eſtabliſhing that arrangement of Nature's works which Linnæus has planned, or how far thoſe enquiries may aid in fixing doubtful connections, this Society are beſt able to determine *.

The habits and manners of *Tæniæ* are little known, becauſe they live in ſituations where they cannot be obſerved, and therefore only become the ſubjects of examination when they are removed out of their natural ſituations, or after the death of the animal in whoſe body they have lived.

The *Tæniæ*, as well as many other worms that inhabit the bodies of living animals, appear deſtined to feed upon the juices of thoſe animals which are already animalized; they are conſequently found in the alimentary canal, and uſually at the upper part of it,

* I cannot omit publicly acknowledging my great obligations to Mr. Watſon, Mr. Hunter, and Dr. Baillie, for their liberality and friendſhip in permitting me to examine and make drawings from the worms in their reſpective collections.

where

where there is the greateſt abundance of chyle, which ſeems to be the natural food of *Tæniæ*.

It does not appear that *Tæniæ* are calculated to live in any other ſituations than living animal ſubſtances. — That theſe worms ſhould be created for the purpoſe of producing diſeaſe in the animal which they inhabit, is abſurd; it would rather ſeem that nature has not intended any ſituation to be vacant, where it was poſſible to carry on the work of multiplying the ſpecies of living beings. By allowing them to live within each other, the ſphere of increaſe is conſiderably enlarged. There is however little doubt that worms, and more eſpecially the *Tæniæ*, do ſometimes produce diſeaſed ſtates of the bodies which they inhabit; and we are alſo well aſſured, that worms do exiſt abundantly in many animals without at all diſturbing their functions, or annoying them in the ſmalleſt degree.

Some diſeaſed ſtates of animal bodies are highly favourable to the increaſe of worms; as dropſy to that of hydatids, and the rot in ſheep to that of the *Faſciola hepatica*, &c. But, in theſe inſtances, worms are rather to be conſidered as concomitants of diſeaſes, than a ſource of them. When *Tæniæ* have arrived at ſome conſiderable growth, it appears that they always produce diſeaſed affections. With reſpect to the probable duration of theſe animals lives, Mr. Hunter has given me permiſſion to make the following extracts from a very curious hiſtory of a *Tænia* which is preſerved in his collection.

" *Marian Burgoin*, a native of Lauſanne in Switzerland, at the age of fourteen years, was affected with pains in her ſtomach and head, rigors, &c.; theſe ſymptoms continued and were gradually increaſed. At the age of nineteen ſhe came to England, and was adviſed to take purging medicines, by which ſhe voided a portion of *Tænia lata*. She continued for ſome years to take draſtic purges,

and repeatedly voided portions of this *Tænia*, which were generally about two yards in length; ſhe voided, at different times, twelve of theſe pieces, but none of them had that extreme joint which is conſidered to be the head. About eight years after her coming to England, ſhe took the Switzerland medicine, and afterwards the head, together with a large portion of this animal's body, were evacuated; ſhe then perfectly recovered her health. From the foregoing hiſtory it is probable that the head of this *Tænia* had exiſted for the ſpace of twelve or thirteen years; or if ſhe had voided a head previous to her arrival in this country, we may ſtill ſuppoſe the preſent animal to have lived eight years, becauſe during this laſt period the hiſtory was accurately and attentively preſerved."

It is a curious circumſtance in the account of this woman, that ſhe was conſiderably relieved from all her uneaſy ſymptoms after voiding each portion of this *Tænia*; but in the courſe of three weeks they always returned as before, and were not alleviated until ſhe voided another portion. May we not account for this by ſuppoſing that the body of the *Tænia* was gradually regenerated, after each piece, which we have mentioned, had been broken off; and that the ſymptoms returned and kept pace with the growth of the worm; its extenſion along the alimentary canal, and its attachments there, proving a ſource of irritation proportioned to its length?

There appears to be a ſeries of diſtinct ſpecies of *Tæniæ*, each having its peculiar animal, like the *Pediculi* and *Acari*. The ſpecies of *Tæniæ* are however not confined *ſingly* to particular animals. Men are ſubject to ſeveral different ſpecies of them; and even the people of particular countries and climates are ſubject to particular ſpecies of *Tæniæ*. The people of England have the *Tænia Solium*, and rarely

any other ſpecies. The people of Switzerland have the *Tæniæ lata*, &c.

The ſtructure of *Tæniæ* is very ſimple, for, being intended to be nouriſhed by already digeſted food, they are deſtitute of the complicated organs of digeſtion.

The *Tænia Solium* of Linnæus is the animal which I intend to deſcribe particularly; but other ſpecies, and other ſimilar worms, will be taken notice of, by way of illuſtration.

This animal is compoſed of a head, in which is a mouth adapted to drink up fluids, and an apparatus for giving the head a fixed ſituation. The body is compoſed of a great number of diſtinct pieces, articulated together, each joint having an organ whereby it attaches itſelf to the neighbouring part of the inner coat of the inteſtine. The joints neareſt the head are always ſmall, and they become gradually enlarged as they are farther removed from it; but towards the tail a few of the laſt joints again become diminiſhed in ſize. The extremity of the body is terminated by a ſmall ſemicircular joint, which has no opening in it.

The external parts of this animal are clothed with a fine membrane reſembling cuticle; immediately under which there is a thin layer of fibres, lying parallel to each other, and running in the direction of the length of the animal's body: theſe fibres ariſe from a denſe, white, opake line of ſubſtance, which connects the individual joints together; and the layer of fibres, having clothed both the flatted ſides of the joint, is inſerted into the ſame kind of ligamentous ſubſtance which connects the next ſucceeding joints together.

The motions of this animal's body are always in the direction of theſe fibres, and from hence we may conclude that they perform the office of muſcles. It may be worthy of remark, that theſe

fibres

fibres are not at all vascular, which shews that the actions of muscles are not necessarily connected with vascularity.

The head of this animal is composed of the same kind of materials as the other parts of its body; it has a rounded opening at its extremity, which is considered to be its mouth. See TAB. 25. fig. 1, 2. This opening is continued by a short duct into two canals; these canals pass round every joint of the animal's body, and convey the aliment, fig. 3. Surrounding the opening of the mouth are placed a number of projecting radii, which are of a fibrous texture, whose direction is longitudinal. These radii appear to serve the purpose of tentacula for fixing the orifice of the mouth, as well as that of muscles to expand the cavity of the mouth, from their being inserted along the brim of that opening: see fig. 2. After the rounded extremity or head has been narrowed into the neck, as is represented in fig. 2, the lower part becomes flatted, and has two small tubercles placed upon each flatted side; the tubercles are concave in the middle, and appear destined to serve the purpose of suckers for attaching the head more effectually. The internal structure of the joints composing the body of this animal, is partly vascular, and partly cellular; the substance itself is white, and somewhat resembles in its texture the coagulable lymph of the human blood. The alimentary canal passes along each side of the animal, sending a cross canal over the bottom of each joint, which connects the two lateral canals together. See fig. 3.

I have often injected three feet in length of these canals with coloured size, by a single push with a small syringe. The injection will not however pass from below upwards along these canals; I could never make it go in this direction beyond two joints, and it appeared to be stopped by valves in the lateral canals, situated

immediately below the places where the croſs canals are ſent off. The alimentary canal, as it is here deſcribed, is continued into the extreme joint, where it becomes impervious, there being no opening analogous to an anus. The individual joints have each a vaſcular ſtructure occupying the middle part (ſee fig. 4.), which is compoſed of a canal paſſing from the top of the joint to the bottom, and from its ſides are ſent off a number of lateral canals nearly at right angles; theſe veſſels contain a fluid like milk, which is alſo globular, and after the death of the animal it is found coagulated. When injecting this middle vaſcular ſtructure, I have often made the injection paſs into the alimentary canals, by a number of very ſmall openings; but could never, on the contrary, inject the central veſſels from the alimentary canals; it would ſeem as if there were a valvular apparatus fixed at the outer extremities of thoſe radiated canals. The remaining part of the body is compoſed of a cellular ſubſtance.

The mechaniſm of thoſe parts of this animal which are ſubſervient to its ſubſiſtence being now deſcribed, it remains for us to take a general view of the manner in which the animal is nouriſhed.

The materials compoſing even the moſt ſimple animals not being permanent, but ſuffering continual waſte and growing unfit for their purpoſes, it becomes neceſſary to repleniſh this waſte by taking ſubſtances into their bodies, called food; and this food afterwards becomes a part of the ſolids of the animal. The food which *Tæniæ* feed upon, perhaps requires little change before it becomes a part of the animal's body. It is taken in by the orifice which we have called the mouth, and being propelled into the alimentary canal, it is made to viſit, in a general way, every part of the animal's body.

The

The central ſtructure of veſſels placed in each joint ſeems calculated to abſorb the fluid from the alimentary canal, for the immediate purpoſe of ſuſtaining and repairing the parts of the body in their vicinity, which is probably done by depoſition, but there ſtill remains a great deal of cellular ſubſtance into which no veſſels enter*. Such parts of the bodies of theſe animals are poſſibly nouriſhed by tranſudation of the alimentary fluid into their cells, or it may be effected by the capillary attraction of their fibres. It appears that there are animals totally deſtitute of vaſcularity, as ſome ſpecies of Hydatids, Polypi, &c. in which tranſudation of fit matter, or capillary attraction by their fibres, ſeems to be the only ſource of nouriſhment. As *Tæniæ* have no excretory ducts, the decayed parts of their bodies are, moſt likely, diſſolved into a fluid which tranſudes through the ſkin like perſpiration, and with this view the ſkin of this animal is extremely porous.

The ſenſes of theſe animals are few, but ſtill are ſufficient for their purpoſes. I have never ſeen any thing reſembling brain or nerves in the *Tæniæ*; but as they are highly ſenſible to ſtimuli, it is moſt reaſonable to conclude, that they have a conſiderable portion of nervous matter in the compoſition of their bodies, that is, of ſuch matter as is ſuſceptible of ſtimuli. Indeed we can hardly conceive how any animal can exiſt without ſuch matter in its compoſi-

* The *Tænia* ſeems to be one of the moſt ſimple vaſcular animals in nature, and its central ſtructures of veſſels appear to be more like reſervoirs for the nutritious fluid, than circulating veſſels, for the contained fluid can only be puſhed out of one canal into another, and even then it will not have viſited all the parts of the animal's body. Probably this kind of conſtruction enables theſe animals to live for a conſiderable time without food, which their ſituation and imperfect form may render neceſſary. As this animal has no anus, it would appear that the whole of its alimentary fluid is fit for nouriſhment, and that no part of it is excrementitious.

tion*. *Tæniæ* have no particular organs of ſenſe; the ſenſe of touch is therefore the only evident ſource of intelligence which they poſſeſs.

The mode of increaſe or propagation of theſe animals appears to be principally by ova. Linnæus and many other naturaliſts ſpeak confidently of the ova of *Tæniæ*, mentioning their ſhape, ſize, &c.; but I have never ſeen any thing like ova, which I could decidedly ſay belonged to theſe animals, excepting ſome globular bodies, which I ſaw by a powerful magnifying glaſs, in the ducts that open into the lateral oſcula; ſee fig. 6. There is every reaſon to believe that *Tæniæ* produce ova, and that their ova, as well as thoſe of other inteſtinal worms, are ſo conſtructed as to be very little periſhable. From this circumſtance they may paſs along the circulating veſſels of other animals, without having their lives deſtroyed. We cannot eaſily explain the phenomena of worms being found in the eggs of fowls, and in the inteſtines of a fœtus before birth, except by ſuppoſing their ova to have paſſed through the circulating veſſels of the mother, and by this means been conveyed to the fœtus.

The openings in the edge of each joint compoſing the body of the *Tænia Solium*, are ſometimes placed alternately on the oppoſite ſides, and at other times are placed on the ſame ſide for three, four, or even five ſucceſſive joints. Theſe openings, which have been called oſcula, are little concave, ſhallow cups, formed by the projection of the ſurrounding edges, which are thickened like lips; at the bottom of theſe cups there is a ſmall opening leading into a canal,

* After I had written this eſſay, I learned that Mr. Hunter has entertained a ſimilar opinion to that which is now ſtated, and which he applies to many of the lower tribes of animals. I alſo underſtand that he has adduced ſomething ſimilar to this in his lectures; and as I have attended thoſe lectures, I cannot ſay that ſuch hints (although at preſent loſt to my recollection) may not have given riſe to the opinion here adduced.

which croſſes halfway over the body of the joint, and then turns downwards; here it ends, and does not communicate with any of the neighbouring veſſels, as I have found by repeated injections.

The uſes of theſe oſcula ſeem firſt to be that of ſuckers or tentacula, for attaching the long body of this animal to the inner coats of the inteſtines; I have ſeen them ſerving this office, and it appears that the external lips and cup are chiefly employed in it.

The ſecond uſe of the oſcula appears to be ſubſervient to generation; and the canals, ſee fig. 6. ſeem to be the oviducts. In a *Tænia* of this ſpecies, which I obtained before it was dead*, I obſerved at one part where it had formed a knot upon itſelf, that two pairs of theſe oſcula were in contact with each other, and were agglutinated together by a viſcid mucus. I was not at that time aware of the poſſible nature of this connection, and neglected preſerving them in that ſtate. I now ſuſpect, however, that they were in the act of copulation, and that a mutual influence takes place previous to the formation of ova. From hence it appears that each joint is an individual, yet dependent upon the head and other parts for its ſubſiſtence, the means of propagation being as much in the power of every joint as it is in the power of a common ſnail, which is an hermaphrodite.

The chance of an ovum being placed in a ſituation where it will be hatched, and the young find convenient ſubſiſtence, muſt be very ſmall; hence the neceſſity for their being ſo prolific.

If they had the ſame powers of being prolific which they now have, and their ova were afterwards very readily hatched, then the multiplication of theſe animals would be immenſe, and become a nuiſance to the other parts of the creation.

* From a young woman in Hermitage-ſtreet in the year 1789.

Another

Another mode of increaſe allowed to *Tæniæ* (if we may call it increaſe) is by an addition to the number of their joints. If we conſider the individual joints as diſtinct beings, it is ſo; and when we reflect upon the power of generation given to each joint, it makes this conjecture the more probable. We can hardly ſuppoſe that an ovum of a *Tænia*, which at its full growth is thirty feet long, and compoſed of four hundred joints, contained a young *Tænia* compoſed of this number of pieces; but I have ſeen young *Tæniæ* not half a foot long, and not poſſeſſed of fifty joints, and ſtill were entire worms. We have alſo many reaſons to believe, that when a part of this animal is broken off from the reſt, it is capable of forming a head for itſelf, and becomes an independent being. The ſimple conſtruction of the head makes its regeneration a much more eaſy operation than that of the tails and feet of lizards, which are compoſed of bones and complicated veſſels; but this laſt operation has been proved by the experiments of Spallanzani and many other naturaliſts.

I have ſeen a disjoined part of a *Tænia*, one of whoſe extremities had begun to put on the appearance of a head; the extreme joint had become rounded, and the broken end had aſſumed the form of a deep cup, of which the margin was platted in a radiated manner, and the ſurface of the torn ſtump was much ſmaller than it muſt have appeared when firſt broken. Theſe circumſtances corroborate the opinion of this ſecond mode of increaſe, and indeed ſomething very analogous is evident both in hydatids and in many vegetables. In Dr. Hunter's collection there are hydatids which are found in cyſts of the liver, on whoſe internal ſurface are viſible a number of ſmall pearl-like veſicles, which are attached to it; this ſeems to be the mode of increaſe peculiar to theſe bodies. Chains of individuals having a mutual connection are very common in the vegetable kingdom: the common *Mentha* has a running root, which

which ties together a number of plants that are in other reſpects independent of each other: they become perfectly independent, and continue their exiſtence without any inconvenience, after theſe connecting roots are divided; in this circumſtance there appears to be ſome analogy between theſe plants and the tape worm. In the common potatoe there is a mode of increaſe, by forming a number of bulbs at the root, which is totally independent of ſexual generation; theſe bulbs become ſeparate individual plants after a year, and are then independent of their parent. Something ſimilar takes place in the Tulip, and in the *Sempervivum globiferum*, where there is a mode of increaſe by forming cluſters of leaves that in time are puſhed off by ſucceeding leaves; theſe bulbs of leaves, having each a ſmall root, take hold of ſome neighbouring earth, and become diſtinct beings: this natural operation is ſomething like the artificial mode of increaſing vegetables by cuttings.

When inteſtinal worms produce a diſeaſed ſtate of the animal's body which they inhabit, various remedies are adviſed for removing them, many of which are ineffectual, and others very injurious by the violence of their operation. Draſtic purges ſeem to operate upon *Tæniæ*, partly by irritating the external ſurface of their bodies, ſo as to make them quit their holds; and partly by the violent contractions produced in the inteſtine, which may ſometimes divide the bodies of *Tæniæ*, and even kill them by bruiſing. I would here propoſe the trial of a ſimple remedy, which (a priori) promiſes to be ſucceſsful; I mean ſmall ſhocks of electricity paſſed frequently through the regions of the abdomen; the lives of the lower orders of animals ſeeming to be eaſily deſtroyed by ſuch ſhocks of electricity as do not injure the larger and more perfect animals.

In Mr. Goeze's very elaborate and important Hiſtory of Worms, he has repreſented many ſpecies of *Tænia*. The heads are drawn very accurately, and elegantly engraved; but he has repreſented

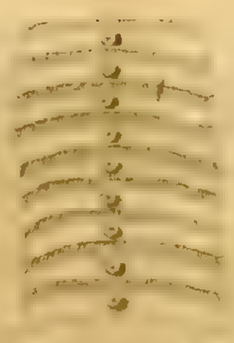
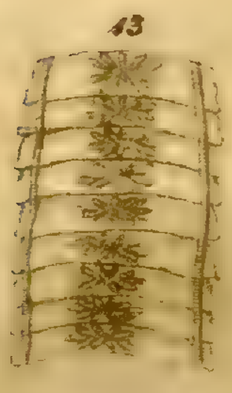
the vaſcular ſtructure of *Tæniæ* to vary exceedingly in the different joints of the ſame animal: this is a miſtake, and ariſes from his not having injected thoſe veſſels, but drawn them as they appear naturally. In this ſtate the veſſels are ſeldom all filled with the coagulated fluid, and thoſe which remain empty are inviſible: thus, in proportion to the number and relative ſituations of thoſe filled canals, the ſtructure will appear different; by injection, however, I have found them to vary extremely little in the different joints of the ſame animal.

In another inſtance Mr. Gocze appears to be miſtaken; he ſuppoſes the lateral oſcula to be connected by a duct with the middle ſtructures of veſſels. I have found, by repeated careful injections, that this never happens. Mr. Goeze ſeems alſo to have taken the middle ſtructures of veſſels for ovaria or oviducts, and has accordingly deſcribed the globules in the fluid which they contain as the ova: but this fluid being found coagulated after the animal's death makes it appear much more of the nature of blood, and, beſides, I have ſeen it tinged with bile. In the delineations of the heads of *Tæniæ*, in Mr. Goeze's book, he has exhibited the fimbriæ placed round the mouths as evidently calculated to ſerve the purpoſe of tentacula, in the *Tænia Felis* particularly. Vide Goeze Eingew. pl. 24. fig. 3, 4.

Explanation of the Figures, TAB. 25.

THE drawings have been made from ſuch portions of the worms as appeared beſt ſuited to illuſtrate their ſtructure, more eſpecially the formation and functions of thoſe parts which ſeemed deſtined to ſerve the purpoſes of nouriſhing the animal's body, and of procreation.

The

Tenia.

The different vascular structures were in most instances injected, and often dissected, to shew more clearly the arrangement of those vessels.

The parts are in general represented of the bigness which they appear to the naked eye, when contained in bottles of fine spirit. The heads are in most cases drawn from views through a magnifying glass. Representations of the heads and structure of other species are given by way of illustration; and the *Fasciola hepatica*, fig. 17, is exhibited to shew the great affinity (in structure) between that and *Tæniæ*.

Fig. 1. Shews the head of the *Tænia Solium* magnified: at its upper extremity it forms a circular plane, in the centre of which is a round opening, represented by the dark-shaded circle; this opening is the mouth, which leads by a duct into the lateral or alimentary canals. The mouth is surrounded by projecting radii, whose fibres run lengthways. From the extremity downwards there is a rounded narrow part which may be called the neck, below which it becomes flatted and broad, and two hollowed tubercles appear upon each flatted side; these are represented by the two dark-shaded spots.

Fig. 2. Is the same head, of its natural bigness, and which belonged to a *Tænia* twenty feet in length.

Fig. 3. Shews the alimentary canals, in a portion of the same *Tænia*, of their natural bigness. The dark-shaded undulating lines are the alimentary canals, which are seen to their full extent in this portion of the worm.

Fig. 4. Shews the middle system of vessels, in two joints, which are represented by the dark lines.

Fig. 5. Shews two joints, from one ſide of which a ſlip was torn down to ſhew the veſſels underneath, and alſo the direction of the fibres in the ſlip, which are accumulated into little faſciculi like muſcular fibres.

Fig. 6. Exhibits three joints, having the ducts leading from the lateral oſcula injected; the dark tranſverſe lines leading from each oſculum, ſhew the ſize, direction, and extent of theſe ducts.

Fig. 7. Shews the edge of two joints turned forwards, and the appearance of the oſcula in this point of view.

Fig. 8. Repreſents the whole of theſe canals in their relative ſituations.

Fig. 9. Exhibits a view of the head of a *Tænia* from the Dog*. The head is bent upon the neck, and preſents a geometrical view of its face, which is flat, and has four tubercles ſituated at equal diſtances from each other; there are here two ſets of radii ſurrounding the mouth, the innermoſt of which probably ſerve to open the mouth, whilſt the outermoſt act as tentacula.

Fig. 10. Is the ſame head, of its natural ſize.

Fig. 11. Is the head of a *Tænia*† from the Cat, magnified. Here the radii project beyond the circumference of the head, and are aptly conſtructed for the purpoſe of tentacula; the tubercles are here four in number.

Fig. 12. Shews a portion of the *Tænia lata*, the oſcula of which are ſituated in the middle of each joint.

* *Tænia canina*, Gmelin's Syſt. Nat. Linn.

† *Tænia Felis* of Gmelin's edition of the Syſtema Naturæ.

Fig. 13. Shews the lateral alimentary canals of the *Tænia lata*, which have no croſs canals, and the central veſſels are of a ſtar-like form, and extend only into a ſmall part of each joint.

Fig. 14. Is the tail-extremity of the *Tænia lata*, which is deſtitute of any aperture*.

Fig. 15. Is a *Tænia* from the Ox†, having oſcula on each edge of each joint. In this figure are repreſented the lateral canals as in the *Tænia lata;* but the central veſſels are formed by radiated canals, which iſſue from a middle canal, running tranſverſely over each joint.

Fig. 16. Shews ducts leading from the lateral oſcula, which terminate in little annular canals; in theſe canals I have ſeen ſmall opake globular bodies: this is a portion of the laſt-deſcribed *Tænia.*

Fig. 17. Is a repreſentation of the *Faſciola hepatica*, found in the bile-ducts of Sheep: the upper extremity is terminated by a narrow neck, having an opening at its end; this opening is the mouth. At the root of the neck is ſhewn a tubercle with a triangular cavity in it; this tubercle is partly for attaching the body in different ſituations, and partly for the purpoſes of generation.

Fig. 18. Shews a duct leading from the mouth into a convo-

* I was favoured with the following account of a perfect *Tænia lata*, which is preſerved in Mr. Watſon's muſeum. The account is tranſcribed from his catalogue.

Mr. Tatiſcheff, a Ruſſian gentleman, had been long troubled with *Tæniæ*, and had ſometimes voided portions of them, but was never perfectly free from them until he applied to a noted woman in Switzerland, who gave him a medicine, with much parade and ſecrecy, at bedtime, and the next morning he voided the above-mentioned worm, which he afterwards preſented to Mr. Watſon.

† *Tænia ovina*, Gmelin. Syſt. Nat. Linn.

luted

luted canal, which has much the appearance of inteſtine: this canal terminates in two veſſels which are ſeen paſſing down the middle of the animal's body, and giving off a number of ſmall ramifications; theſe paſs towards the edges of the body, where they terminate, and the injection puſhed by a ſyringe into the mouth fills the whole of theſe veſſels. There is nothing like an anus.

Fig. 19. Repreſents a duct leading from the triangular opening in the tubercle: this duct is analogous to the oviduct of the *Tænia*, and doubtleſs ſerves the ſame purpoſe; it has no communication with the other veſſels.

XXIII. *A new*

XXIII. *A New Method of preſerving Fungi*, &c. *By William Withering, M. D. F. R. S. and F. L. S.*

Read Dec. 4, 1792.

FROM a conviction that many of the difficulties attendant upon the ſtudy of the Agarics, and ſome other genera of Fungi, aroſe from the want of a method of preſerving them in a ſtate fit for compariſon one with another, I attempted ſome years ago to accompliſh this purpoſe, by immerſing them in various chemical liquids, and after ſome trials found it poſſible to preſerve their habit completely, and in ſome meaſure alſo their texture and colours. By the ſame methods I alſo found that Moſſes and Lichens might be preſerved in great perfection.

A continued attention to this ſubject gave riſe to a great number of experiments; but I ſhall not trouble the Society with the detail of them, rather confining myſelf to a more particular deſcription of the two methods which I have found moſt practicable and efficacious, and only curſorily mentioning ſome of thoſe that have failed.

No. I.

To half a pound of vitriol of copper, called blue vitriol, reduced to powder, add a pint of cold water: ſtir them together for a minute, and then throw away the water: upon the remaining vitriol pour half a pint of boiling water, and ſtir them frequently until the liquor be nearly cool. Set it by in a warm place, for two or three days, to cryſtallize.

Take any quantity of theſe cryſtals, add to them as much hot water as will barely diſſolve them, and put the ſolution into a vial.

To two or three quarts of pure ſpring water, put as much of this ſolution of blue vitriol as will give to the whole a very ſlight bluiſh tinge: then add to it, rectified ſpirit of wine, in the proportion of a pint to a gallon: filter the liquor through blotting or cap paper, and put it into bottles for uſe.

No. II.

Diſſolve a quarter of an ounce of ſugar of lead in a pint of diſtilled or very pure ſpring water, made boiling hot; add ſeven pints of pure cold water, and one pint of rectified ſpirit of wine: filter the liquor, and keep it in bottles.

The above proportion of ſpirits of wine is ſufficient for the thickeſt and moſt ſucculent ſpecimens, but leſs will do for ſuch as are thin and not juicy. If the ſpirit be ſufficient to prevent mouldineſs, it is enough, for more has a tendency to extract the colours.

Put

Put the ſpecimens to be preſerved into wide-mouthed jars made of flint glaſs, and well fitted with corks: fill the jars quite full with one or other of the above liquids, ſo as to leave in as little air as poſſible: cork the jars very cloſe, covering the corks with tin foil, or thin ſheet lead, ſuch as may be had from the dealers in tea, turning the edge of the lead or tin downwards ſo as to lap over and under the edge of the jar.

The dark-coloured plants are very apt to diſcolour the liquor, the milky ones to render it turbid, and ſome of the juicy ones to excite the vinous fermentation. In any of theſe caſes the liquor muſt be repeatedly changed.

Agarics may be tranſported to almoſt any diſtance with little damage, by the following method. Put them into an earthen jar upon a layer of moſs a little preſſed down; cover them with more moſs, carefully filling up the interſtices; and thus go on ſtratifying them until the jar be quite full; pour in the liquid No. I. as long as the moſs will continue to imbibe any; then ſtop the mouth of the jar ſecurely. It may be uſeful to mention, that when ſeveral ſpecies are put into one jar, they may be labelled with ſlips of card paper, written upon with black lead pencil.

I have principally uſed the liquor No. I.; but No. II. is beſt adapted to preſerve ſome of the more tender colours, and it alſo keeps the texture more firm. Let the botaniſt however be careful not to mix the liquors, nor to change one for the other after a plant has once been wetted with one of them.

Amongſt the leſs ſucceſsful attempts, I ſhall juſt mention that acids, even thoſe of mineral origin, are apt to produce mouldineſs; that neutral ſalts ſoften and deſtroy the texture of the plants; though perhaps a weak ſolution of common ſalt, with a

ſufficient quantity of ſpirit of wine, might be uſed advantageouſly for the preſervation of Fuci and other marine vegetables.

Earthy ſalts ſeem uſeleſs, except alum, which preſerves them tolerably well for a time, but at length they are apt to become mouldy. Spirit of wine, either by itſelf or diluted with water, is an excellent preſerver of the texture, but deſtroys the colour of the plants.

No doubt but future experiments will diſcover methods preferable to thoſe now mentioned, and that we may at length hope to ſee the cabinet of the naturaliſt adorned with one of the moſt varied tribes of the vegetable creation.

XXIV. *Objections againſt the Perceptivity of Plants, ſo far as is evinced by their external Motions, in Anſwer to Dr. Percival's Memoir in the Mancheſter Tranſactions. By Robert Townſon, Eſq. F. R. S. Edinb.*

Read Dec. 4, 1792.

HOWEVER ſanguine we may be in our expectations of extending the limits of human knowledge, we cannot avoid perceiving that there are boundaries which it never can exceed. Theſe boundaries are the limited faculties of the human mind, which, though fully ſufficient to anſwer all the purpoſes of common life, are an inſuperable barrier to the enquiries of ſpeculative men. None feel more the truth of this obſervation, than thoſe engaged in phyſiological enquiries; the operations of nature being ſo complicated, and at the ſame time carried on in ſo ſecret a manner, as to keep us ignorant of the moſt common phænomena.

If phyſiologiſts have been unſucceſsful in many of their enquiries into the animal œconomy, they have been ſtill more ſo with reſpect to vegetables: for how little do we know at this day of the courſe of their fluids, and of the power by which they are moved? Are we not in the vegetable kingdom where we were near two centuries ago in the animal, when the great *Harvey* withdrew the veil?

The many beautiful analogies exiſting between the two organized kingdoms of nature, their ſimilar origin from egg or ſeed, their ſubſequent developement, and nouriſhment by intus-ſuſception; the power of continuing their ſpecies, the limited time of their exiſtence, and, when not carried off by diſeaſe and premature death, poſſeſſing in themſelves the cauſe of their own deſtruction—have been ſo favourable to the ſuppoſition of the exiſtence of a complete chain of beings, that there appeared to the favourers of this opinion nothing to be wanting to connect them, but the loco-motive faculty; for irritability, from phænomena in a few vegetables, had been granted them by ſome. This loco-motive faculty, which is conſidered as a conſequence of volition, which is an attribute of mind, they ſay * is manifeſted in the direction of the roots towards the ſoil which affords them their moſt proper nouriſhment, and in the direction of the tender ſhoots and leaves towards the light, which is likewiſe neceſſary to their well-being. Theſe facts are admitted, but not the conſequences drawn from them.

It muſt indeed be allowed, that vegetables do on ſome occaſions act as though poſſeſſed of volition, avoiding thoſe things that are injurious to them, and turning towards thoſe that are beneficial; thus appearing to act by choice, which muſt be preceded by perceptivity, a favour that nature has granted I think to the animal world alone. The following are brought as examples†:

A plane-tree twenty feet high, growing upon the top of a wall, ſtraitened for nouriſhment in that barren ſituation, directed its roots down the ſide of the wall, till they reached the ground ten feet below. It has been amply repaid, ſay they, for its trouble ever ſince,

* Dr. Percival, Manchester Tranſactions.

† Manchester Tranſactions.

by

by plenty of nouriſhment, and a more vigorous vegetation has been the conſequence. On another occaſion, a plant being placed in a dark room, where light was admitted only through an aperture, put forth its ſhoots towards the aperture, which elongating paſſed through it; and this likewiſe was rewarded for its trouble by plenty of light and free air.

That appearances ſo ſimilar to thoſe that are obſerved in animals ſhould be conſidered as proceeding from the ſame cauſe, viz. volition, is not to be wondered at, when ſo many of the inferior orders of animals hardly poſſeſs ſo much of the loco-motive faculty—particularly by men of warm imaginations, who, prepoſſeſſed in favour of an opinion, were graſping at every diſtant analogy to ſupport it. Though, as I have ſaid, we are by no means acquainted with the courſe of their proper fluids *(ſucci proprii)*, or with the power by which they are moved, nor even can ſay by what power it is that the fluids, which are its food, are taken in; yet ſo far we know, that here, as in the animal œconomy, there is a conſtant change and evolution of their fluids, and that a conſtant ſupply is neceſſary, without which they ſoon periſh. This ſupply, ſo neceſſary, muſt be taken in by abſorption; and it is this act of abſorption that I ſhall endeavour to prove to be the efficient cauſe of theſe motions in vegetables, and thus exclude volition from having any cauſation in theſe phænomena; for it is from their not having been explained upon mechanical principles that mind has been reſorted to. Mind is in general our laſt reſource when we fail in explaining natural phænomena. I could wiſh that phyſiologiſts were agreed upon the kind of abſorption which takes place here, whether it be by active open-mouthed veſſels, which in the common opinion takes place in the animal œconomy, or by capillary attraction, which is the moſt general opinion in the vegetable; but the theory

I ſhall offer to the conſideration of the Linnean Society will agree with either.

The firſt conſideration is—That an inert fluid is in motion.

Secondly—That, poſſeſſing no motion in itſelf, it owes this motion to the plant.

Thirdly—That as action and re-action are equal, whilſt the plant draws the fluid towards itſelf, it muſt be drawn towards the fluid, and that in the reverſe ratios of their reſpective reſiſtances.

Now whether this abſorption be performed by veſſels acting as in the animal œconomy, or by veſſels of the nature of capillary tubes, is of little moment, provided only that an abſorption be admitted; for it is evident, that if action and re-action be the ſame, the abſorbed fluids, which poſſeſs no motion in themſelves, cannot be put in motion by the open-mouthed active veſſels, without being drawn in the direction of the abſorbed fluids. But ſhould we prefer the theory which explains this abſorption by capillary attraction, which theory I think is the moſt prevalent, we ſhall ſtill find that the abſorbing veſſels are drawn towards the fluid. This is equally true as evident, whether applied to that ſimple hydraulic inſtrument, the ſtraw, through which the ſchool-boy ſucks, or to the moſt complicated machine of the natural philoſopher. Theſe principles will, I think, be ſufficient to explain thoſe appearances in vegetables which have ſerved as a foundation, or have been conſidered as ſigns of their perceptivity and volition, and which, as far as I have learnt, have never been attempted to be explained, viz. the direction of their roots towards the ſoil which affords them the beſt nouriſhment, and the young and tender ſhoots towards the light: for here is an abſorption of water and light. The abſorption of water is eaſily aſcertained; but that of light, by its ſubtleneſs, eludes our experiments, with probably many other fluids of great

importance

importance to the healthy ſtate of the vegetable world. But to make the connexion more complete between the two organic kingdoms, it has not only been found that plants move towards their food like wiſe and intelligent beings, but they likewiſe turn aſide from thoſe ſoils, &c. which are injurious to them, or at leaſt afford them but a ſcanty nouriſhment. This is a deception: it is only the immediate conſequence of their motion towards their nouriſhment; for when the root of a tree or plant changes its courſe, on account of meeting with a rock, or with a hard, ſtiff, and barren clay, or other object that does not afford it proper nouriſhment, it is owing not to any dereliction of theſe objects, but to no attraction from abſorption acting in that direction, but one from a more favourable ſoil. The ſmallneſs of the reſiſtance of theſe fluids cannot be urged againſt this theory: the motion to be explained is only the tendency of the naſcent ſhoots, no one having pretended that the ſolid wood could alter its direction; and this power, however feeble, is always acting. I am not ignorant that theſe are not the only motions which are thought to announce the perceptivity of plants. The motions obſerved in the ſtamina and other parts at the time of fecundation, the ſpiral direction of the ſtems of ſome*, the uſe of the cirrhi of others, and the burſting of the capſules, have all, with many other powers, been thought to favour this opinion. Theſe are but powers nature has beſtowed upon them for their preſervation and pro-

* I have read, and heard it more than once aſſerted, that the *Lonicera* and other plants with the caulis volubilis, which are twiſted either dextrorſum or ſiniſtrorſum, can change this natural direction; ſo that when two *Loniceræ*, or two branches of the ſame *Lonicera*, meet, the one turns to the right, the other to the left, that they may afford to each other a better ſupport. This is a miſtake, and, if true, would only counteract the intention of nature, which is a mutual ſupport; for this would prevent their uniting ſo firmly together. Some of the cirrhi of the *Bryonia*, &c. turn to the right, others to the left, but not to accommodate one another.

duction,

duction, which can no more be conſidered as the conſequence of volition, than the fall of their leaves at ſtated periods, their growth and decay, which have never been conſidered as the conſequence of mind, any more than the increaſe or deſtruction of animal bodies, the efficient cauſe of which may for ever remain unknown.

When all is conſidered, I think we ſhall place this opinion amongſt the many ingenious flights of the imagination, and ſoberly follow that blind impulſe which leads us naturally to give ſenſation and perceptivity to animal life, and to deny it to vegetables; and ſo ſtill ſay with Ariſtotle, and our great maſter Linnæus—*Vegetabilia creſcunt & vivunt*; *animalia creſcunt*, *vivunt*, & *ſentiunt*.

XXV. *An*

XXV. *An Eſſay on the various Species of Sawfiſh.* By Mr. John Latham, F. R. and A. S. S. and F. L. S.

Read Jan. 8, 1793.

THE purport of the following paper is to endeavour to identify, as different ſpecies, the various kinds of Sawfiſh, which have hitherto cauſed much confuſion, from being eſteemed as mere varieties, or ſexual differences of one and the ſame ſpecies, with the view of promoting a further inveſtigation of the ſubject, which it is hoped this crude Eſſay may pave the way to. The matter is more particularly intereſting, as very little has been added of late years, or indeed from the time of *Belon*; who, if I miſtake not, was the firſt who gave a figure of any part of the animal*.

In regard to place in the ſyſtem, moſt authors have fixed the *Sawfiſh* in the *Squalus* or *Shark* genus, with which it muſt be confeſſed it greatly coincides, excepting the elongation of the head into a *beak* or *ſnout*, which part in ſome meaſures one-fourth, in others more than one-third of the whole length of the fiſh: however, it cannot be denied, that it alſo reſembles the genus of *Raia* or *Ray* in many particulars, which *Klein* gives for a reaſon when he wiſhes it to be placed between the two; though he heſitates to make it a diſtinct one. In reſpect to myſelf, I cannot but own,

* *Aquat.* 1553. 8vo. p. 66. a figure of the ſnout.

that were only a ſingle ſpecies known to me, as was ſuppoſed by the ancients, I ſhould moſt certainly join in the received opinion of placing it with the *Sharks*, though differing in ſome particulars, rather than to form a new genus for it.

It has been urged, that the difference of ſhape and ſize of the ſpines in the ſnouts of various ſubjects may ariſe from age or ſex: the latter I cannot deny, as far as relates to the two firſt deſcribed, as the ſpines reſemble each other more than thoſe which follow; yet in regard to the firſt two, whoever will make a fair compariſon will moſt probably join with me in ſeparating them, till we have ſufficient authority to unite them into one ſpecies.

The number of ſpines alſo, were no other diſtinction manifeſt, will of itſelf be ſufficient to form a preciſe character for dividing the ſeveral ſpecies.

Klein obſerves, that in the embryo ſtate the ſides of the ſnout are as ſmooth as the gums of a new-born infant; but, in this caſe, we are inclined to think that the ſpines make their appearance not long after its excluſion, and that they grow very quickly; for in a ſpecimen of the ſecond ſpecies, now before me, the total length of which I conjecture to have been about thirty inches, the ſpines are full one-fourth as long as thoſe of a nearly full grown ſpecimen in the *Leverian Muſeum*. Another obſervation may likewiſe be drawn from the compariſon of the ſnouts of the ſmaller ſized with the full grown ones; for as ſome have been met with which meaſured only eight inches, and contained from thirty to thirty-four ſpines on each ſide; and others, of the very ſame ſpecies, of three feet in length, in which were found no greater number; may we not ſafely conclude, that they do not increaſe by being ſhed in the firſt ſtages of life, to be replaced by others, as in the jaws of the human ſpecies, and thoſe of quadrupeds?

The

The *roſtrum* or *ſnout* in every ſpecies which I have yet ſeen has been ſtraight, or at moſt curved upwards in a very trifling degree, and the repreſentations of it, in authors who have figured it, lead us to think the ſame; one inſtance only excepted, wherein a fœtus of one with twenty-ſix ſpines in the roſtrum is engraved, with that part bent in the form of a bow*: this ſurely muſt be a ſingular *luſus naturæ*; unleſs we can ſuppoſe it to have been bent while freſh, and ſo dried, in order to enhance the value of the ſpecimen by exciting the wonder of the naturaliſt.

The *Sawfiſh* is ſaid to be found both in the *northern* and *ſouthern* parts of the world, and ſome have been met with of our firſt and ſecond deſcribed of fourteen or fifteen feet in length, the ſnout meaſuring one-third of the total length. The ancients had but a very imperfect knowledge of the ſubject, when *Pliny* aſſerts, that *Priſtes* are met with in the *Indian Sea* of two hundred cubits in length †, and in another place he calls it the mighty fiſh called *Priſtis*‡. The ſame notion alſo had *Aldrovandus*, when he figured an ideal one of a cetaceous magnitude, with a creſt on the front, ſpouting the water from tubes on the top of the head, in the manner of ſome of the *whale* genus. The ſame may alſo be ſeen in *Geſner*, *Piſo*, *Marcgrave*, and others, who have copied from one another. On a level with theſe ſtands *Olaus*, who takes for granted, that the *Sawfiſh* is able to divide a ſhip in two with the *ſnout* §.

However, to ſay no more of ſuch idle tales, it is certainly in the power of fiſhes of this kind to be injurious to the more defenceleſs.

* *Bloch. Fiſch. Deutchl.* t. 120.

† *Plin. Nat. Hiſt.* lib. 9. cap. 3.

‡ Id. lib. 36. cap. 5.

§ "It will ſwim under the ſhips, and cut them, that the water may come in, and he may feed upon the men when the ſhip is drowned." *Olaus Magnus, Hiſt. Goth.* book 21. ch. 10.

*Freſier** ſaw a battle between ſeveral *Sawfiſhes* and a *Whale*, when all of them attacking the *Whale* at once, ſoon became victorious.

It is too plain, by the very little I have been able to collect of the natural hiſtory of the ſubject of this paper, that the ancients had paid but little attention to it: to elucidate the matter is reſerved for the more enlightened naturaliſts of the preſent day; and it is to be hoped, that no opportunity of examination may henceforth be neglected by thoſe who may be fortunate in having ſpecimens, more eſpecially recent ones, paſs under their obſervation.

Thoſe who may wiſh to retain the whole of the following under the genus of *Squalus*, will have no difficulty in adjuſting them according to their wiſhes: on the other hand, ſuch as agree with me in ſeparating them therefrom, will ſee beneath an attempt to form a *new one* under the name of

PRISTIS.

Caput roſtro elongato plano, utrinque ſpinoſo.
Spiracula 4—5 ad latera colli.
Corpus oblongum, teretiuſculum, cute aſpera coriacea.
Os ſub capite.
Nares ante *os*, lobo membranaceo ſemitectæ.
Pone *oculos* foramina ovalia duo.
Pinnæ ventrales approximatæ, & in mare circa genitalia poſitæ.
Pinnæ anales nullæ.

* *Voy. de la Mer. du Sud.*

1. ANTI-

1. Antiquorum.

Pr. roſtro ſpinis validis utrinque 18—24. Tab. 26. f. 1.

Squalus Priſtis, *Lin. Syſt. Nat.* 1. *p.* 401. 15. *Faun. Suec.* 297. *Muſ. Ad Fr.* 1. *p.* 52. *Mull. Lin. Th.* 3. *tab.* 11. *f.* 2. (ſpin. 18.) *Gmel. Lin.* 1. *p.* 1494. 15. *Fab. Fn. Groenl. p.* 130. 91. *Mull. Prodr. p.* 38. 319. *Klein. Miſſ. Piſc.* 3. *p.* 12. *No.* 11. *tab.* 3. *f.* 1, 2. (Pullus.)

Plin. Nat. Hiſt. lib. 9. *cap.* 2. *Cluſ. Ex. tab.* 14. *p.* 136 (ſpin. 20.) *Aldrov. Cet. p.* 692. *Will. Ichth. p.* 61. *tab. B.* 9. *fig.* 5. (fig. Cluſii.) *Raii Syn. Piſc. p.* 23. *Olear. Muſ. p.* 41. *t.* 26. *f.* 1. *Rondel. Piſc.* 487.

Bell. de Aq. t. in p. 66. (Langue de Serpent.)

Valent. Amboin. p. 33. *t.* 19. *f.* 52. *Bloch Fiſch. Deutch. p.* 37. *t.* 120. *Du Tertre Ant. p.* 207. (Spadon.) *Bonann. Muſ. Kirch. t.* 288. *t.* 21.—*Cabinet de Ste. Genev. t. p.* 100. *Brouſſ. Act. Par.* 1780. *p.* 671. (La Scie.) *Piſ. Ind. Occ. p.* 51. *Marcgr. Braſ. p.* 158. (Araguagua). *Gronov. Zooph. p.* 33. *Arted. Syn.* 66. *Id. Syn.* 93. *Brown. Jam.* 458. 1.

Habitat in oceano.

Totum *corpus* ad 15 pedes longum, ſupra nigricans, ſeu leucophæo-griſeum, *abdomine* albicante.—*Caput* antice planum.—*Roſtrum* ad 5 pedes longum, ſpinis validis numero utrinque 18—24.——*Os* dentibus granulatis inſtructum.—*Oculi* magni iride aurea.—Pone *oculos* foramina duo oblonga.—*Spiracula* quinque.—Pinna dorſalis prima ventralibus oppoſita, altera inter primam & caudæ apicem media—Pectorales latæ longæque—Caudalis brevior quam congeneribus.

This ſpecies and the following grow to the largeſt ſize of any which

which have yet come under the inſpection of the Naturaliſt, ſome ſpecimens meaſuring fifteen feet in length.

The head is rather flat at top, the eyes large, with yellow irides; behind each is a hole, which ſome have ſuppoſed may lead to an organ of hearing*. The mouth is well furniſhed with teeth, but they are blunt, ſerving rather to bruiſe its prey than to divide it by cutting. Before the mouth are two other foramina, ſuppoſed to be the noſtrils. The *roſtrum*, *beak*, or *ſnout*, is in general about one-third of the total length of the fiſh, and contains in ſome eighteen, in others as far as twenty-three or twenty-four *ſpines* on each ſide; theſe are very ſtout, much thicker at the back part, and channelled, inclining to an edge forwards. The *fins* are ſeven in number—viz. two *dorſal*, placed at ſome diſtance from each other—two *pectoral*, taking riſe juſt behind the breathing-holes, which are five in number—two *ventral*, ſituated almoſt underneath the firſt *dorſal*—and laſtly the *caudal*, occupying the tail both above and beneath, but longeſt on the upper part. The general colour of the *body* is a dull grey, or browniſh, growing paler as it approaches the belly, where it is nearly white.

2. PECTINATUS.

Pr. roſtro ſpinis anguſtioribus utrinque ad 34. Tab. 26. fig. 2.

Priſtis ſeu Serra, *Geſner Aq. fig. in p.* 728. (ſpin. 34.) *Id. Ic. An. p.* 171.—*Muſ. Beſler. tab.* 17. *f.* 3. (ſpin. 28.)—*Id. f.* 1. (caput, ſpinis 25.) *Aldr. Cet. f. p.* 692.—*Johnſt. Piſc. p.* 8. *t.* 111.—(ſpin. 28.)—*Blaſ. Anat. p.* 466. *t.* 49. *f.* 13—*Bloch Deutch. p.* 37. *t.* 120. (roſtr. arcuat.) *Knorr. Delic. p.* 56. *t.* H. 4.—*Olear. Kunſt. p.* 38. *t.* 25. *f.* 1.—*Pontop. Hiſt. Norv.* II. *p.* 240. (ſpin. 25.)

Habitat in oceano.

* Nos foramina hæc *meatus auditorios* eſſe credimus. *Willughb.*

Corpus

Corpus a priore non multum differt.—*Roſtri* ſpinæ longiores, & minus validæ, numero variant a 25 uſque ad 34.—*Pinnæ* poſticæ magis excavatæ.

This and the former ſpecies have been confounded hitherto by Naturaliſts, nor are we certain that any others have been obſerved by them: and if we may judge by their figures of each, it ſhould ſeem that the firſt deſcribed was the moſt plentiful. That figured in *Geſner* is far from a bad repreſentation, and the one engraved by *Knorr* in his *Deliciæ* is ſufficiently accurate. This ſpecies differs from the firſt, in having the *ſnout* more narrow in proportion at the baſe, and the whole of it more ſlender in all its parts; whereas the firſt is very broad at the baſe, and tapers conſiderably from thence to the point. The ſpines on each ſide alſo are longer and more ſlender, and vary from twenty-five to thirty-four in the different ſpecimens: we have indeed been informed of one which contained no leſs than thirty-ſix ſpines on each ſide of the ſnout; but we muſt confeſs that we have never been fortunate enough to have ſeen ſuch a ſpecimen. This is ſuppoſed to grow to as great a ſize as the former, and in the general make and ſhape of the body does not materially differ.

3. Cuspidatus.

Pr. roſtro ſpinis cuſpidatis latis utrinque 28. Tab. 26. fig. 3.

Habitat — — — —

Roſtrum huic per totam longitudinem latitudinis fere æqualis.—*Spinæ* abbreviatæ, latæ, planæ, ad apicem cuſpidatæ.

Of this ſpecies I have only ſeen two ſpecimens of the *roſtrum*, one in my own collection, the other in that of Mr. *Parkinſon*—the firſt

firſt is about a foot and a half in length, the other more than two feet and a half: in both of theſe are twenty-eight ſpines on each ſide; but the diſtinguiſhing feature is in the ſpines themſelves being particularly flat and broad, and ſhaped at the point more like the *lancet* uſed by ſurgeons in bleeding, than any other figure. We believe that no author has hitherto taken notice of this ſpecies.

4. MICRODON.

Pr. roſtro ſpinis minutis vix roſtrum exerentibus. Tab. 26. fig. 4.

Habitat — — — —

Corpus ut in congeneribus, 28 pollices longum.

Roſtrum planum, a baſi ad apicem modice attenuatum.—*Spinæ* utrinque 18, minus conſpicuæ.

A complete ſpecimen of this fiſh is in the muſeum of Mr. *Parkinſon*, which is probably unique; the total length is twenty-eight inches, the *ſnout* occupying ten; from the baſe of this to that of the *pectoral* fins four inches; between the *pectoral* and *ventral* fins ſix. The two *dorſal* fins occupy nearly the ſame proportions in reſpect to each other; but the hinder one is the ſmalleſt, and all of them are greatly hollowed out at the back part, much more ſo than in the two firſt ſpecies.

The *ſnout* differs from that of every other, in ſeveral particulars: it is longer in proportion, being more than one-third of the whole fiſh. The *ſpines* do not ſtand out from the ſides more than a quarter of an inch, and from this circumſtance ſeem far leſs capable of doing injury than any other ſpecies yet known.

5. CIRRATUS.

5. Cirratus.

Pr. roſtro cirrato ſpinis longioribus: brevioribuſque intermediis. Tab. 26. fig. 5. and Tab. 27.

Habitat in *Nova Hollandia.*

In hâc ſpecie *roſtrum* ſpinis circiter 20 acutis, modicè incurvis, munitum; brevioribus a 3—6 interjectis—ad latera ſubtus utrinque cirrus elongatus flexilis.

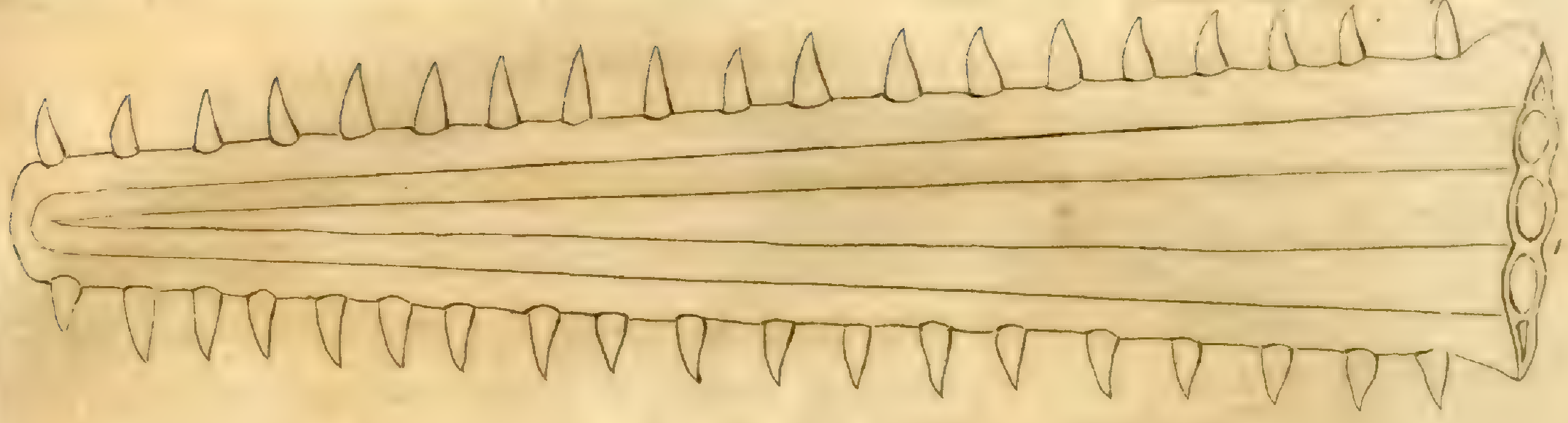
Of this curious and ſingular fiſh we have only met with one ſpecimen, which was brought from *Port Jackſon* in *New Holland*, and is in the poſſeſſion of *Thomas Wilſon, Eſq.* of *Gower-ſtreet*, who obligingly lent it to me, for the purpoſe of deſcribing and figuring it.

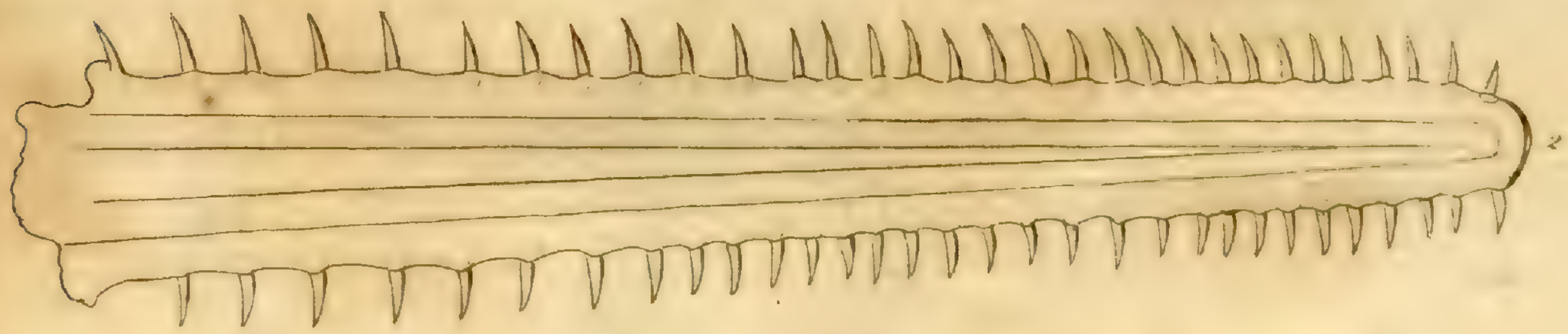
It is a *male*, and the total length about forty inches: the *ſnout*, from the tip of it to the eye, eleven: the *ſpines* widely different from any of the others; they are indeed placed, as uſual, on the edge, but are continued on each ſide even beyond the eyes, as may be ſeen in the drawing. The longer ones are ſlender, ſharp, ſomewhat bent, and about twenty in number; and between theſe are others not half the length of the primal ones, between ſome three or four, between others as far as ſix; and in general the middle one of theſe ſmaller ſeries is the longeſt: beſides theſe, a ſeries of minute ones may be perceived beneath, at the very edge. In the *ſnout* likewiſe another ſigularity occurs:—about the middle of it, on each ſide, near the edge, ariſes a flexible, ligamentous cord, about three inches and a half in length, appearing not unlike the beards at the mouth of ſome of the *Gadus* or *Cod* genus, and no doubt as pliant in the recent ſtate. The colour of the fiſh is a pale brown:

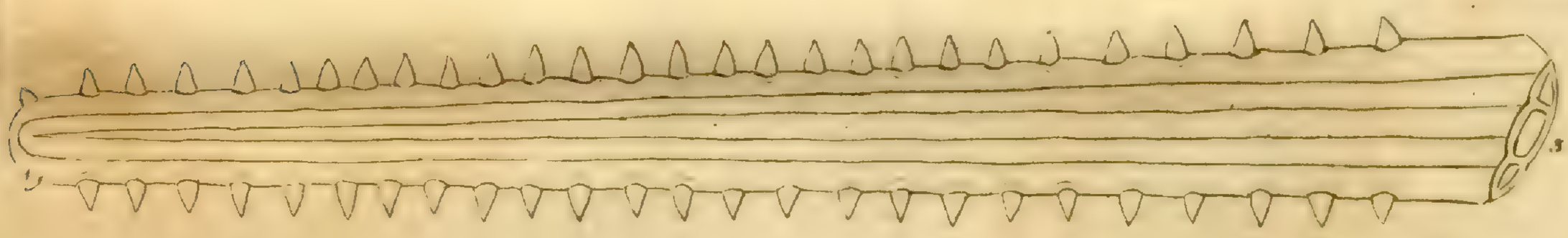
the *breathing apertures* four in number: the *mouth* furniſhed with five rows of minute, but very ſharp *teeth*: as to the reſt, as we have thought right to give a repreſentation of the whole fiſh (Tab. 27.) a comparative view of the parts may be judged of without further deſcription.

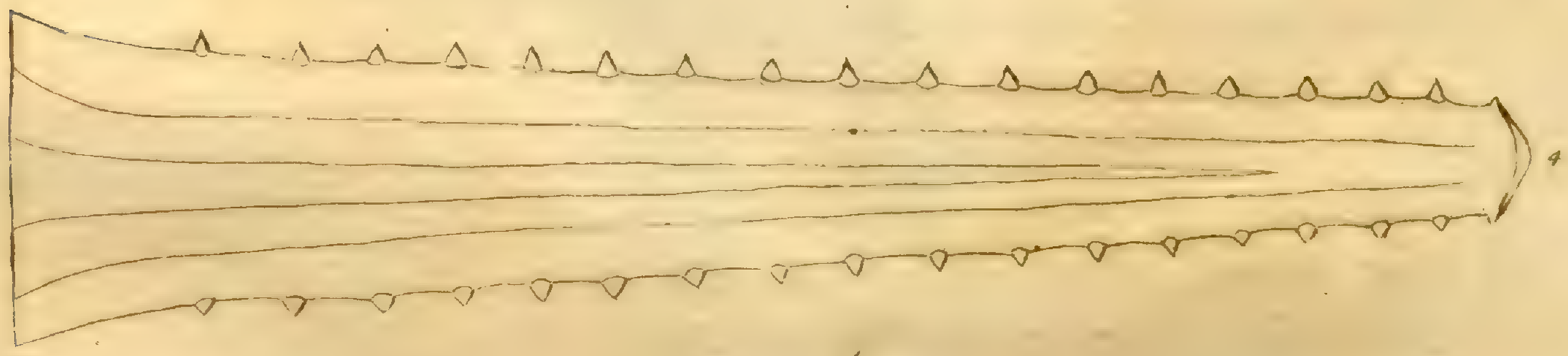
I do not doubt of the above ſpecimen being a young one, as the ſnout ſeems to have ſhrunk much in drying:—but, to determine this matter, it is to be hoped that future voyagers, who may chance to viſit that part of the world from whence this was received, will pay ſtrict attention to the natural hiſtory of ſo curious a production of nature.

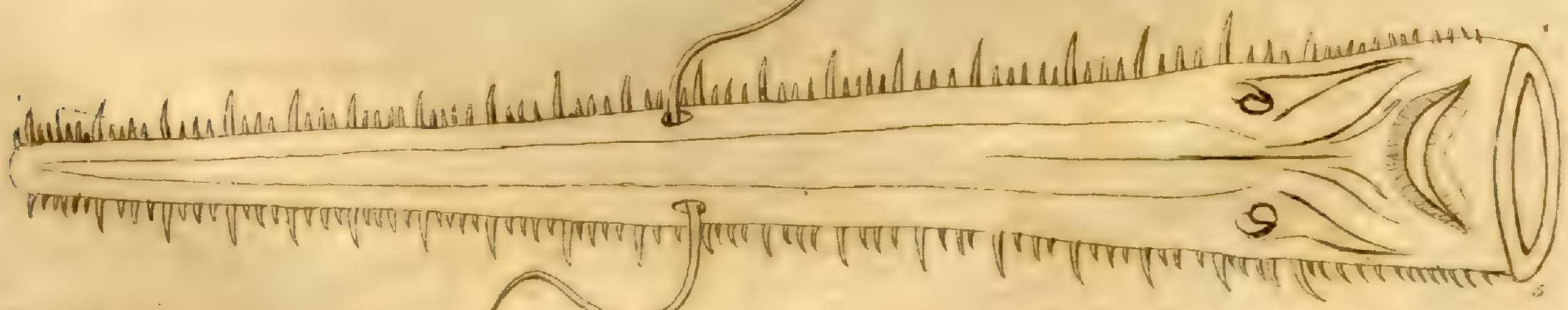
XXVI. *De-*











Linn. Trans. II. tab. 27. fig. 282.

P. cirratus.

XXVI. *Descriptions of Four New British Lichens. By the Reverend Hugh Davies, F. L. S.*

Read Feb. 5, 1793.

1. LICHEN PILULARIS. TAB. 28, f. 1.

L. crustaceus cinereo-albidus, tuberculis pilulæformibus nigris.
Pill Lichen.

A Species unknown to every author I have seen. In examining it attentively, I find some of the younger fructifications perfect scutellæ, with elevated margins of the same colour; these are but few, and seem soon to lose that form. The fructification in decay changes into different shades of brown.

Found in Bodowen-park, Anglesea.

2. L. SIMPLEX. TAB. 28. f. 2.

L. ecrustaceus, tuberculis difformibus plicato-rugosis atris.
Simple Lichen.

THIS, hitherto undescribed, species has no ground, but consists of bare, small tubercles, which, examined with a microscope, appear wrinkled, and of various irregular forms. It seems to affect growing upon a kind of grey slate, which it covers to the extent of many inches together.

Since the drawing of it was taken, I have likewiſe found it on a ſand-ſtone, and then, owing to the unevenneſs of the ſurface, the fructification aſſumes a ſtill more irregular form, ſometimes appearing in ſimple lines, and ſometimes coiled; in ſome degree reſembling the fructification of Lichenoides, t. 29. f. 116. *Dill. Hiſt. Muſc.*

Found with the former.

3. L. CONCENTRICUS*.

L. cruſtaceus albidus, ſcutellis ſubimmerſis confluentibus concentricis atris.

Concentric Lichen.

THE ſcutellæ are ſcarcely raiſed above the ground, depreſſed in the centre, and have a margin which varies in colour, being ſometimes white, ſometimes black. I could have ſuppoſed this to be L. petræus, *Jacq. Collect.* T. 3. tab. 6. f. 2. litt. a. a. a. from his figure; but he refers to *Michelius*, ord. 34. p. 99. n. 53. and to *Hall. Helv.* nos. 2061 and 2062, whoſe deſcriptions by no means accord with this plant; particularly, as neither of thoſe accurate authors has noticed the confluent fructifications, which invariably form concentric ſegments of a circle, affording a moſt diſtinguiſhing characteriſtic.

Found in Whitford pariſh, Flintſhire.

4. L. VARIANS. TAB. 28. f. 3.

L. cruſtaceus albus, ſcutellis atris nitidis: margine albo.

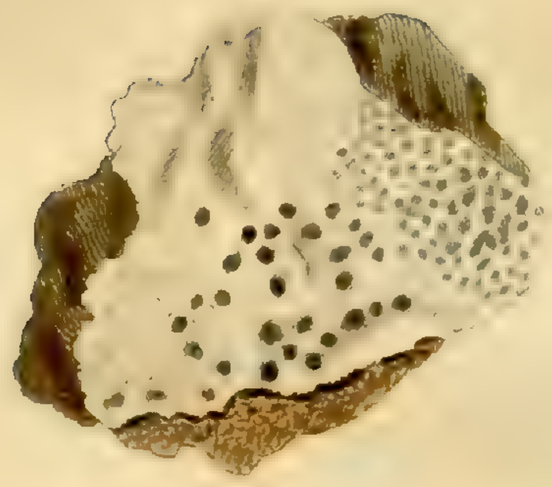
Changeable Lichen.

BY the ſeveral variations of this plant, repreſented at the figures A. B. C. D. it is evident that it varies exceedingly in reſpect of co-

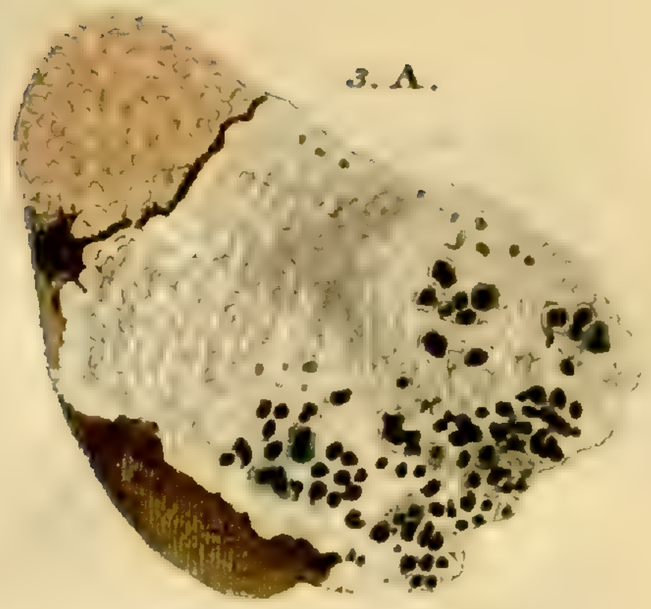
* L. petræus, *Jacq. Coll.* v. 3. 116. t. 6. f. 2. lit. a. a. a. ſynonymis dubiis.

lour,

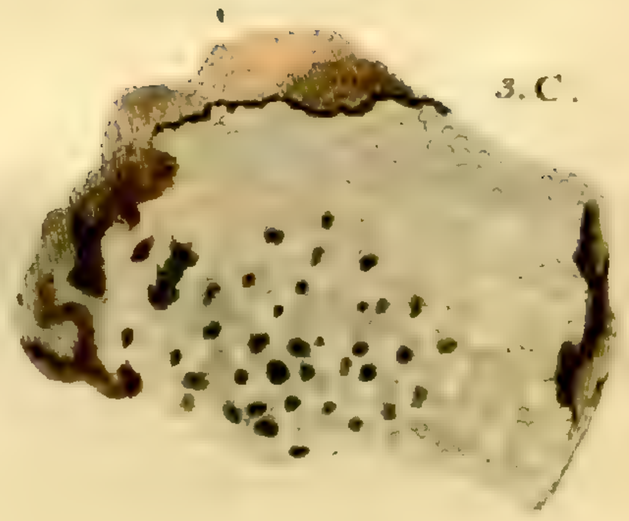
3. B.



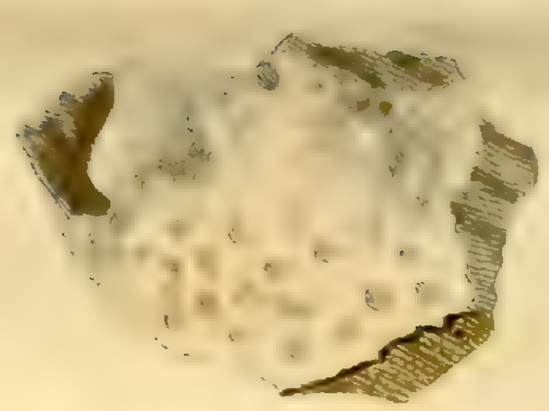
3. A.

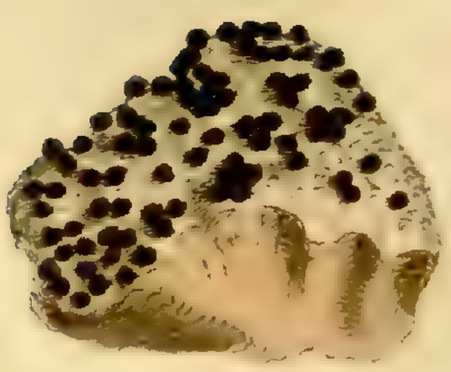


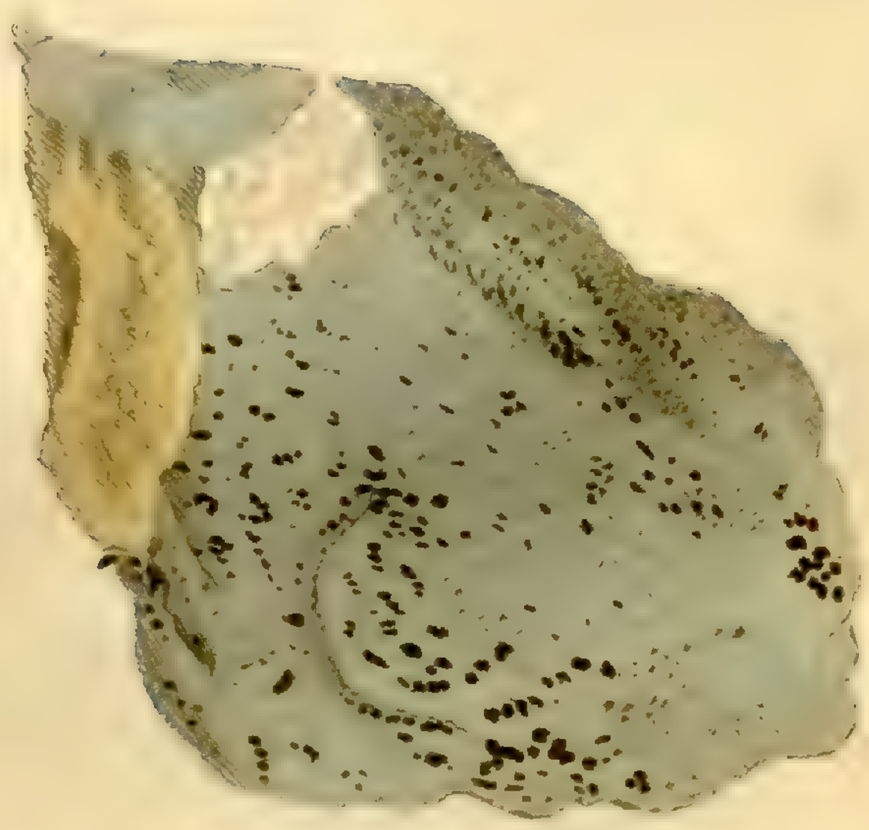
3. C.



3. D.







2

lour, and, with an inattentive obſerver, might paſs for different ſpecies. Its ſtate of perfection is that deſcribed in the *differentia ſpecifica*, when the ground is a fine poliſhed white, and the fructification a bright ſhining black, with a white margin, fig. A. In its ſecond ſtate, it loſes that gloſſy black, fig. B. In its more advanced ſtage, it becomes ſtill paler; and in this ſtate I have ſeen it in a collection under the name of *L. rupicola*, fig. C. As it approaches nearer decay, the ſcutellæ aſſume an ochreous or buff-colour, very different from either of its former appearances, fig. D.

In its laſt ſtage, which I had not obſerved till after the incloſed drawings had been made, it aſſumes a ſtill very different appearance; the diſks of the ſcutellæ diſappear, and there ſucceeds a black duſt, giving it in ſome meaſure the reſemblance of a ſphæria.

The ſingularly-various appearances of this plant afford an opportunity of obſerving how liable perſons are to be deceived by plants of this tribe, which they have not an opportunity of examining in their places of growth; and may ſerve as a caution, that our zeal for diſcovering new ſubjects ſhould not hurry us to create new ſpecies out of imperfect ſpecimens.

Found on the S. W. ſide of Angleſea.

XXVII. *An*

XXVII. *An Account of ſome Plants newly diſcovered in Scotland.* By *Mr. James Dickſon, F. L. S.*

Read Feb. 5, 1793.

ALTHOUGH a very great number of Britiſh plants are deſcribed in the *Flora Anglica* and *Flora Scotica*, yet no perſon can expect in theſe a complete catalogue of the plants of this kingdom; for, though their ingenious authors have done every thing in their power, yet, in a field ſo extenſive, much muſt ſtill remain to be done. Large tracts in Scotland are ſtill unexplored by any naturaliſt, and many plants being merely local, we muſt wait for a more thorough and accurate examination of this kingdom, before we can fix the extent of the Britiſh Flora.

Indeed the operations of Nature are ſo dark and intricate, and her works ſo amazingly profuſe, that it is much to be doubted whether we ſhall ever be able, with the moſt ſcrupulous inveſtigation, to aſcertain the number even of Britiſh plants, when we deſcend to the minuter tribes. The ſpan of human life will be found too ſhort to meaſure the vaſt field of creation.

But thoſe who intend to ſearch for plants ought not to be diſcouraged at their number, nor deſpair of ſucceſs though they tread in the footſteps of ſome former naturaliſt; for every practical botaniſt muſt remember ſome inſtances of his diſcovering plants

in places he had often examined before; and the ſmall plants are ſo numerous, and often ſo crowded together, that we need not wonder if they eſcape our moſt minute obſervation. Where a choice of place can however be had, the wild and unexplored ought certainly to be preferred, though we ſhould by no means overlook the land in cultivation. Numbers of plants, not formerly known to be annuals, are frequently found even among the ſtanding corn: I once found in ſuch a ſituation five different genera upon a piece of earth half an inch ſquare; they were the *Phaſcum ſubulatum*, *Phaſcum axillare*, *Bryum truncatulum*, *Jungermannia anguloſa*, *Riccia glauca*, and *Blaſia puſila*.

In England, where cultivation has made ſo great a progreſs, we cannot expect to find ſuch a variety of plants as in a wild mountainous country; yet, within theſe thirty years, ſome additions have been made to the *Flora Anglica*, though not equal to the numbers that have been added to the *Flora Scotica*.

As the Highlands of Scotland abound with ſuch a variety of ſoil and ſituation, with high ſnowy mountains, deep glens, dripping rocks, torrents of water, and every other ſcene that can attract the attention of the naturaliſt, we may reaſonably expect that, at ſome future period, very large additions will ſtill be made to the *Flora* of that country.

I have frequently made a tour through the Highlands, and never without diſcovering ſome plants. I am ſorry their number is as yet ſo ſmall, but they may ſerve as a ſpecimen of the botanical riches of the country, and induce ſome other naturaliſt to complete what I have only begun.

In a tour through the Highlands, in 1789, I diſcovered the following plants, which are mentioned in my *Faſc. Secund.* p. 29.

VERONICA alpina. *Linn. Spec. Plant.* 15. In montibus propè *Garway Moor*, et in *Ben Nevis*.

VERONICA

VERONICA ſaxatilis. *Linn. Suppl.* 83. in rupibus: *Ben Lawers.*

PHLEUM alpinum. *Linn. Spec. Plant.* 88. in montibus propè *Garway Moor.*

DRABA ſtellata. *Jacqu. enum.* 256. *t.* 4. *f.* 3. Draba hirta *Jacqu. auſt.* 5. *p.* 15. *t.* 432. (non D. hirta *Linn.*) in rupibus: *Ben Lawers.*

HIERACIUM molle. *Jacqu. auſt.* 2. *p.* 12. *t.* 119. in ſylvis Scotiæ auſtralis.

HIERACIUM villoſum. *Linn. Spec. Plant.* 1130. in rupibus humidis: *Ben Nevis.*

HIERACIUM ſpicatum. *Allion. pedem.* 1. *p.* 218. *t.* 27. *f.* 1. 3. in ſylvis Scotiæ auſtralis.

ERIGERON alpinum. *Linn. Spec. Plant.* 1211. in rupibus humidis: *Ben Lawers.*

SALIX RETUSA. *Linn. Spec. Plant.* 1528. in rupibus ſiccis: *Ben Lawers.*

In a tour, in 1792, the following plants enriched my collection.

VERONICA *humifuſa*, racemo terminali, foliis cordato-ſubrotundis crenulatis, caulibus repentibus.

Deſcr. Planta tota proſtrata; caules palmares et ultra, repentes, radicantes, ramoſi.

Folia cordato-ſubrotunda, crenulata, ſcabriuſcula, approximata, inferiora petiolata, oppoſita, ſæpe terna vel quaterna, ſuperiora plerumque ſeſſilia et alterna. *Racemus* terminalis brevis. *Flores* pauci, conferti, breviter pedunculati, læte cærulei.

The above *Veronica* is that which is mentioned in the *Fl. Scotica*, p. 72. for *V. alpina*, and in the App. p. 1138. for a variety of the *V. ſerpyllifolia*: the firſt it is not, nor do I think it can be the laſt.

V. humi-

V. humifuſa I never found but upon very high mountains, and under wet ſhady rocks, where the *V. ſerpyllifolia* never occurs; beſides I have cultivated them both together in the garden for three years, and they always kept very different. *Dill. Giſſ. App. p.* 67. has a V. nummulariæ folio, and *Pluk. Phyt. tab.* 233. *f.* 4. V. pratenſis nummulariæ folio, flore cœruleo; but I doubt neither of them is the *V. humifuſa.*

ERIOPHORUM polyſtachion. Culmis teretibus, foliis planis, ſpicis pedunculatis. *Linn. Spec. Plant.* 76. *Vaill. Pariſ. tab.* 16. *f.* 2. *Leers Fl. Herb. t.* 1. *f.* 5. The figure given by Vaillant is a good one.

E. *polyſtachion* of Hudſ. Lightf. Curtis, Withering, *&c.* is not the above.

I found this firſt in bogs in Northamptonſhire, afterwards near Dunſtable, Bedfordſhire, and in Yorkſhire, Cumberland, and very commonly in Scotland.

ERIOPHORUM anguſtifolium. Culmis teretibus, foliis canaliculato-triquetris, ſpicis pedunculatis. *Hoffm. Fl. Deutſchland.* p. 19. *Vaill. Pariſ.* tab. 16. f. 1. *Curtis, Flor. Lond.*

This is our common *Eriophorum*, and has been miſtaken for the *E. polyſtachion* of *Linn.* *Linnæus*, no doubt, confounds the two together, and refers to the figure in *Vaill.* tab. 16. f. 1. only as a variety of his *polyſtachion;* but if he had ever ſeen both plants together, I have no doubt but he would have made them diſtinct ſpecies.

The following particulars may ſerve to ſhew in what this differs from the *E. polyſtachion.*

1. The root of that is not creeping.—2. The culmus is very erect.—

3. The leaves ſhort and flat.—4. The ſpikes many, upon ſlender footſtalks, and pendulous.—5. The involucrum ſhorter than the ſpike.

ERIOPHORUM alpinum. *Linn. Spec. Plant.* 77. found by Mr. *Brown* and Mr. *Don*, in a moſs about three miles eaſt of Forfar, in the ſhire of Angus.

A ſpecimen of this was preſented to the Linnean Society ſome time ago by Mr. *Teaſdale*.

GENTIANA nivalis. *Linn. Spec. Plant.* 332. Ben Lawers.

SIUM repens. *Jacq. Fl. Auſt.* t. 260. Wet places in the ſouth of Scotland.

SAXIFRAGA cernua. *Linn. Spec. Plant.* 577. Amongſt the rocks on the ſummit of *Ben Lawers*.

STELLARIA ceraſtoides. *Linn. Spec. Plant.* 604. *Smith's Plant. Ic.* t. 15. Ben Nevis.

ASPLENIUM alternifolium. *Murray, Syſt. Vegetab. edit.* 14. *Jacq. Miſc.* 2. t. 5. f. 2. Rocks in the ſouth of Scotland.

POLYPODIUM dentatum, nova ſpecies*. A figure and deſcription of this will be given in my third Faſciculus. Rocky mountains of Scotland.

I found the following, not deſcribed in the *Fl. Scotica*, but in the *Flora Anglica*.

PHALARIS arenaria. Sea-coaſt, near Preſtonpans.

LYSIMACHIA thyrſiflora. Woods in the ſouth of Scotland.

DROSERA anglica. Near Fort Auguſtus.

BARTSIA alpina. Rocks to the eaſt of Malghyrdy.

* P. dentatum. *Faſc. Pl. crypt.* 3. *p.* 1. *t.* 7. *f.* 1.

CAREX

CAREX recurva. South of Scotland.

CAREX brizoides. South of Scotland.

SAGINA apetala. About Inverneſs.

ACROSTICHUM ilvenſe. *Linn.* Rocks of *Ben Lawers.*

This plant has been made a new *Acroſtichum* by my friend Mr. *Bolton*, under the name of *A. alpinum*; and by Dr. *Withering*, *Polypodium alpinum*. I believe it is a *Polypodium*, but at the ſame time I am confident it is no other than the Linnean *A. ilvenſe:* I compared it both at Sir Joſeph Banks's and at Dr. Smith's, and can find no difference but in ſize, the Scotch plant being ſomewhat the ſmaller; but thoſe who are acquainted with ferns will be ſenſible how different they appear, according to their age or places of growth. I have no doubt, therefore, but the Linnean *A. ilvenſe* (*Hudſon's*) and that I found in Scotland are one and the ſame.

XXVIII. *Remarks on the Genus Dianthus. By James Edward Smith, M. D. F. R. S. and P. L. S.*

Read March 5, 1793.

WHEN a tribe of plants has been known from the earlieſt times in which any plants were noticed at all, and has attracted the attention of all botaniſts, as well as of every floriſt and gardener, one would expect it ſhould be well underſtood, and that its ſpecies and varieties ſhould diſtinctly be known one from another. Unfortunately, however, for the acquiſition of truth, the reverſe ſeems generally to be the caſe. The aſſiſtance which the bulk of mankind lend to any diſquiſition requiring acute judgment or deep inveſtigation does not always tend to elucidation, though infallibly in ſome way or other to confuſion. Hence ſuch an endleſs variety of opinions, obſtinately maintained in proportion to the weakneſs of their foundations, upon ſubjects on which moſt has been thought and written; and hence in their turn new ſwarms of writings ariſe from each variety of opinion. Happily for the advancement of natural hiſtory, it has never been a very lucrative ſtudy; otherwiſe even the multiplicity of ſolid facts on which it is founded could ſcarcely have prevented its becoming as diſfigured and obſcure as many others that are.

No genus, except perhaps that of roſes, juſtifies the above remarks more than Dianthus; nor is ſcarcely any one leſs underſtood. This obſcurity does not ſeem to have ariſen, as in the Geranium tribe, from a caſual intermixture of ſpecies, either in a wild or cultivated ſtate; nor does it, as in Roſa, originate in the ſpecies being immenſely numerous, and very nearly reſembling each other, though it muſt be confeſſed their ſpecific differences are, like thoſe of roſes, very difficult to define by methodical characters. The chief ſource of confuſion has been the incorrect labours of authors.

This genus, by the elegance and fragrance of moſt of its ſpecies, as well as the frequent occurrence of many of them throughout Europe, has been noticed more or leſs in every botanical publication. The older botaniſts, emerging as it were from a thick cloud of ignorance and book-learning, to a view of Nature in broad daylight, did not at once acquire the faculty of ſeeing; ſtill longer were they in learning to deſcribe what they ſaw. They ſeem to have looked upon the face of Nature as from a balloon in the air. They could diſtinguiſh a foreſt tree from a roſe buſh; they ſaw the earth was clothed with flowers, and one great refinement of their obſervation ſeems to have been, that ſome were red, yellow, or blue, others white; they diſcovered that the fields were green with graſs, but ſcarcely noted that all graſs was not the ſame; nor did they dream there were tribes below that rank of vegetables, ſcarcely leſs numerous than thoſe above it, and no leſs accurately diſtinguiſhed, no leſs carefully foſtered by the beneficent hand of Nature, than all the gorgeous ornaments of their own flower-gardens. When the ſcience began to make a progreſs under the ſuperintendance of ſome rare genius of gigantic powers, as a Geſner or Cæſalpinus, while each of its footſteps was accurately noted and delineated by the ſcrupulous fidelity of a Cluſius, facts on facts were gradually accumulated, and each new obſervation led

led the way to many more. Happy if all had been made with equal ſagacity, and recorded with equal exactneſs! but every obſerver was not a Cluſius or a Geſner, nor every delineator of plants a Fabius Columna.

The wooden cuts of that day, however wonderful in execution, and excellent for deſcribing large diſtinct plants, in tribes whoſe forms are ſlender and delicate, and whoſe line of diſcrimination is ſmall, are ſcarcely of any uſe, eſpecially as they are ſeldom of the ſize of nature.

The genus of which I am about to treat, is one where figures have ſucceeded the worſt. They have conſequently been miſtaken and erroneouſly quoted, more eſpecially as not half the diſtinct ſpecies of Dianthus are figured at all in old authors, though their books contain numerous trifling and tranſient varieties of D. Caryophyllus, the favourites indeed of floriſts, but which a botaniſt would gladly reſign for certain information concerning real ſpecies, important in the œconomy of nature.

The figures and accounts (for they can ſcarcely be called deſcriptions) of theſe plants in the earlier writers being therefore ſo confuſed, it is much to be lamented that ſyſtematic authors have quoted them with ſo little care. An erroneous ſynonym is worſe than none at all.—Linnæus himſelf has been faulty in this reſpect.

Having long wiſhed for ſome fixed ideas of a genus every day before one's eyes, and ſome ſpecies of which ſtand, the opprobrium of botaniſts, unnamed in every garden, I have made it my buſineſs to collect all the ſpecimens poſſible, and to obſerve every herbarium that it has been my fortune to viſit in different countries; hoping to learn at once to diſtinguiſh one ſpecies from another, and what authors intended by their different accounts. I had alſo in view at the ſame time the genus of Arenaria, ſtill more

intricate in ſome reſpects; but its obſcurity I have been more fortunate in removing than that of Dianthus. It may in a future paper, if this Society ſhould think it worth their acceptance, be illuſtrated with ſome minuteneſs. I had deſtined the ſame pains to the genus of Dianthus; but, having found the confuſion in herbariums and the deſcriptions and ſynonyms of authors inextricable, I am obliged now to content myſelf with offering detached remarks on the ſubject, like thoſe on Veronica printed in the firſt volume of our Tranſactions. I take the ſpecies in their order, as in the fourteenth edition of Syſt. Vegetabilium.

3. D. *ferrugineus*, *Mant.* 563. Linnæus quotes in manuſcript *Miller's Icones* t. 81. f. 2, which is undoubtedly the plant, though an ill-coloured indiſtinct repreſentation, which would be of no uſe if any obſcurity hung about the ſpecies.

7. D. *diminutus*. Of this there is no ſpecimen in the Linnean herbarium. All that I have ever ſeen ſo named, were evidently D. prolifer, varying with a ſingle flower in each common calyx, as Linnæus himſelf ſeems to have been perſuaded.

11. D. *rupeſtris*, *Suppl.* 240, is nothing elſe than D. virgineus, whoſe hiſtory I ſhall give in its place.

12. D. *glaucus*. What Linnæus intended by this is the little white pink with a purple eye, to be found in ſeveral gardens, and which many have thought a variety of deltoides, differing only in the white colour of its flowers, and in having four ſcales to the calyx inſtead of two, which is a variable circumſtance. I confeſs

confeſs myſelf unable to find a ſpecific difference between them, and am perſuaded Mr. Hudſon is right in making it a variety in his Flora Anglica, for that it is what he intends by his deltoides β, I learned from himſelf, and his quotation of Dillenius, fig. 384, evinces it. The laſt mentioned author gives this as a Britiſh plant on report only; nor do I know any certain inſtance of its being found wild, except Mr. Lightfoot's authority in Flora Scotica, where it is rightly given as D. glaucus of Linnæus. One cannot but wonder Mr. Hudſon ſhould have applied this denomination, with its *differentia ſpecifica*, to another plant, the Chedder pink, at the ſame time quoting Dill. f. 385, which has nothing to do with D. glaucus, and which Linnæus, indeed, by no leſs an error, makes a variety of his D. virgineus. This point I have already cleared up in Engliſh Botany, t. 62, deſcribing the Chedder pink as a new ſpecies by the name of D. cæſius, of which therefore I ſhall ſay no more at preſent.

17. D. *arenarius.* For this little-known ſpecies Linnæus is the only certain authority. The ſpecimen in his herbarium is from Sweden. The ſynonyms of Bauhin and Cluſius he has eraſed from his own copy of Species Plantarum, and ſurely the *Armerius flos tertius* of Dodonæus, p. 176, ought alſo to be ſtruck out. Nor do I find any good reaſon to depend on the ſynonyms of Le Monnier and Sauvages.

Neither has this any right to a place in our Flora Anglica. Mr. Hudſon has aſſured me he meant, by his D. arenarius, the common pheaſant's eye pink of the gardens, which occurs ſometimes apparently wild on old walls, and ſeems to belong to D. Caryophyllus.

19. D. *vir-*

19. D. *virgineus.* Linnæus having originally deſcribed this in the firſt edition of Species Plantarum from Burſer's Herbarium, preſerved at Upſal, without having any ſpecimen in his own, I had no means of determining it with certainty but by applying to Profeſſor Thunberg, who very obligingly ſent me a drawing of the original ſpecimen, by which it clearly appears this is no other than the plant Profeſſor Jacquin has rightly taken for virgineus, and figured in his *Flora Auſtriaca*, vol. 5. *append.* t. 15. I have it from himſelf. Linnæus, towards the latter part of his life, having had this pink in his garden at Upſal from the Alps, deſcribed it afreſh, forgetting it was his own virgineus; and forgetting alſo that he had already named one Dianthus alpinus, he gave that denomination to this ſuppoſed new ſpecies. The latter error however his ſon corrected, publiſhing it in the Supplement by the name of rupeſtris. But another fault occurs in that work with reſpect to the ſynonym, Caryophylleus primus, *Cluſ. hiſt.* p. 282, figura tenuis. Linnæus wrote it *figurâ tenus*, meaning that the figure, not the deſcription, agreed with his plant. I beg leave however to aſſert that neither is by any means referable to it. This is the very ſame individual figure, printed in Dodonæus by the name of *Armerius flos tertius*, above mentioned. For what it was intended, I do not preſume to determine; unleſs it may be my cæſius, with which the deſcription of Cluſius agrees pretty well. Yet here the weighty opinion of Dillenius in Hort. Eltham. is againſt me. The ſynonyms of this genus form the moſt inextricable botanical labyrinth I ever yet entered.

I gathered D. virgineus on the white limeſtone rocks oppoſite the poſt-houſe on Mount Cenis in Auguſt 1787. The ſtems were decumbent, not proſtrate, and the flowers appeared to me inodorous. Linnæus remarks the contrary. It ought to

be removed to the diviſion of *Flores ſolitarii, plures in eodem caule.* The ſpecimen in Burſer's Herbarium, being a meagre one, ſufficiently ſhews why Linnæus placed it among thoſe whoſe ſtems are ſingle-flowered. I have reaſon to think, from the information of my moſt accurate friend Mr. Davall, F. L. S. this is commonly taken for D. Caryophyllus in Switzerland. What Haller has called it I do not yet know. His account of this genus is as confuſed as any body's.

20. D. *arboreus.* Of this Linnæus had no ſpecimen, and he confounds under it two very different ſpecies. His ſpecific character, *foliis ſubulatis*, agrees beſt with the plant of Tournefort; but in his own copy of Sp. Plant. he has eraſed that ſynonym, ſeeming thus to intend Bauhin's for his real arboreus. Yet he has added as a ſynonym, Caryophyllus arboreus ſylveſtris, *Alpin. Exot.* 59. *t.* 38, juſtly obſerving that the figure is bad. Indeed ſo execrable is this figure, and ſo incomplete the deſcription, not a word being ſaid whether the figure be of the natural ſize or diminiſhed, which in this caſe would determine the point, that I cannot tell to which of theſe two moſt different ſpecies it belongs. Suppoſing it not to be a much diminiſhed repreſentation, it muſt be Tournefort's Caryophyllus creticus arboreus, juniperi folio, *Coroll.* 23. which I ſhall hereafter deſcribe, and with which Alpinus's deſcription of the "ſlender leaves reſembling thoſe of wild pinks, and the ſmall flowers," agrees much better than with Bauhin's plant. The latter, which I venture to conſider as the real D. arboreus of Linnæus, is very tolerably figured and deſcribed in John Bauhin's *Hiſtoria, vol.* 3. 328.

21. D. *fruticoſus.* I am perſuaded, from Tournefort's own ſpecimens, this is only a variety of the laſt mentioned arboreus, having

broader and obtuſe leaves, but differing in no other reſpect from that of Bauhin.——They are both very noble and ornamental plants, and it is pity they are loſt to our gardens.

The preſent remarks, imperfect as they are, would be ſtill more ſo if I did not attempt to deſcribe ſuch new ſpecies of this genus as are certainly known to me, as well as to reform the ſpecific characters of the others, ſome of which are at preſent quite inſufficient, and even erroneous.

Thoſe whoſe characters need no alteration I ſhall merely enumerate by the Linnæan names.

* *Flores aggregati.*

1. D. *barbatus.*
2. D. *carthuſianorum,* floribus ſubaggregatis, ſquamis calycinis ovatis ariſtatis tubo brevioribus, foliis linearibus trinerviis.
3. D. *ferrugineus.*
4. D. *Armeria.*
5. D. *japonicus. Thunb. Fl. Jap.* 183. *t.* 23.
6. D. *prolifer.*

** *Flores ſolitarii, plures in eodem caule.*

7. D. *diminutus,* anne varietas præcedentis?
8. D. *Caryophyllus,* floribus ſolitariis, ſquamis calycinis ſubrhombeis breviſſimis, petalis crenatis imberbibus.

9. D. *pomeridianus*, flor. ſolitariis, ſquamis calycinis ovatis acutis breviſſimis; tubo apice tantum ſtriato, petalis emarginatis ſubintegerrimis.

This is the only ſpecies I have ever ſeen whoſe calyx is ſmooth in the lower part, while the upper half is ſtriated, and that very ſtrongly and accurately.

10. D. *deltoides*, flor. ſolitariis, ſquamis calycinis ovato-lanceolatis acutis ſubbinis, foliis obtuſiuſculis ſubpubeſcentibus, petalis crenatis.

β. D. glaucus *Linn.* Varietas ſquamis calycinis ſæpiùs quaternis, foliis magis glaucis, ſubinde glabris, limbo petalorum albo (nec carneo) ſemper cum lineâ tranſverſâ purpureâ ad baſin ut in α.

11. D. *chinenſis*, flor. ſolitariis, ſquamis calycinis ſubulatis patulis foliaceis tubum æquantibus, petalis crenatis, foliis lanceolatis.

I have a plant from Mr. Sikes's garden at Hackney which ſeems a hybrid between this ſpecies and D. barbatus.

12. D. *monſpeliacus*, flor. ſolitariis, ſquamis calycinis ſubulatis rectis tubo parum brevioribus, corollis multifidis, caule erecto.

13. D. *plumarius*, flor. ſolitariis, ſquamis calycinis ſubovatis breviſſimis obtuſiſſimis muticis, corollis multifidis.

14. D. *crinitus*, flor. ſolitariis, ſquamis calycinis ovalibus mucronatis ſubdivergentibus tubo triplo brevioribus, petalis multifidis imberbibus.

Caryophyllus orientalis, minimus, tenuiſſimè laciniatus, flore purpureo. *Tournef. Cor.* 23.

Habitat in Armeriâ. Variat flore albo. *Tournefort.*

Caules

Caules ſpithamei, læves. *Folia* linearia, anguſtiſſima, breviſſima, obtuſiuſcula, lævia. *Flores* duo vel quatuor in caule, erecti. *Calyx* tubo gracili, ſtriato, dentibus lanceolatis rectis acutiſſimis; ſquamis ad baſin quatuor, exactè ovalibus, dorſo ſtriatis, mucrone brevi patente. *Petala* anguſta, limbo ad baſin uſque irregulariter multifido-capillaceo, imberbi.

15. D. *ſuperbus*, flor. ſolitariis paniculatis, ſquamis calycinis breviſſimis acuminatis, petalis multifido-capillaribus, caule erecto.

16. D. *attenuatus*, flor. ſolitariis, ſquamis calycinis brevibus lanceolatis acuminatis ſubſenis; tubo apice attenuato, petalis crenatis.

Caryophyllus maritimus, ſupinus, foliis anguſtiſſimis, aculeatis, multiflorus. An Caryophyllus ſylveſtris repens multiflorus C. B. Prod.*?—*Herb. Tournef.*

Habitat in maritimis Galliæ meridionalis, *Brouſſonet.* Ex horto regio Pariſienſi etiam habui.

Caules diffuſi, baſi lignoſi, tortuoſi, ramoſiſſimi; rami floriferi adſcendentes, pedales, folioſi, teretes, glabri, apice in ramulis 2 vel 3 diviſi, unifloris. *Folia* ſubulata, mucronato-pungentia, glauca, margine ſcabra; caulina internodiis breviora. *Flores* carnei, inodori. *Calyx* ſquamis ſex ad baſin, quarum interiores ſæpè margine membranaceæ; tubo ſtriato, apicem verſus ſenſim attenuato, dentibus erectis, margine membranaceis. *Corolla* parva, crenata, imberbis.

17. D. *pungens*, flor. ſolitariis, caulibus paucifloris, ſquamis calycinis breviſſimis mucronatis patentibus; tubo gibbo, petalis integris.

* Nequaquam. Conf. D. virgineum.

18. D.

18. D. *virgineus*, flor. ſolitariis, caulibus paucifloris, ſquamis calycinis breviſſimis obtuſiſſimis binis, petalis crenatis.

D. rupeſtris. *Linn. Suppl.* 240.

Caryophyllus ſylveſtris repens multiflorus. *Bauh. Pin.* 209. *Prod.* 104. *Herb. Burſer. vol.* II. *p.* 99.

* * * *Caule unifloro herbaceo.*

19. D. *caſius*, caulibus ſubunifloris, ſquamis calycinis ſubrotundis brevibus, petalis crenatis pubeſcentibus, foliis margine ſcabris.

D. cæſius, *Sowerb. Engl. Bot. t.* 62.

— glaucus, *Hudſ. Fl. Angl.* 185.

Armeriæ ſpecies flore in ſummo caule ſingulari, *Raii Syn.* 336.

Tunica rupeſtris, folio cæſio molli, flore carneo, *Dill. Hort. Elth.* 401. *t.* 298. *f.* 385.

Habitat in Angliâ. In Helvetiâ, *Davall.*

Radix lignoſus. *Caules* plures, ſpithamei, erecti, ſimplices, glabri, quadranguli, conjugationibus foliorum duobus vel tribus, uniflori, vix unquam biflori. *Folia* lineari-lanceolata, obtuſiuſcula, glauca, margine ſcabra. *Calycis* ſquamæ tubo triplo breviores, ovato-ſubrotundæ, obtusè mucronatæ, ſtriatæ. *Petala* carnea, obtusè duplicato-crenata, baſi lineata atque barbata.

20. D. *alpinus*, caule unifloro, petalis crenatis, ſquamis calycinis exterioribus foliaceis tubum ſubæquantibus.

Variat foliis obtuſis & acutis.

21. D. *arenarius*.

* * * * *Fru-*

* * * * *Fruteſcentes.*

22. D. *arboreus*, caule fruticoſo, foliis oblongis ſubcarnoſis, ſquamis calycinis numeroſis obtuſis arctè imbricatis breviſſimis.
Betonica coronaria arborea cretica, *Bauh. Hiſt.* 3. 328. *f.* 2.
β. D. fruticoſus, *Linn.*
Caryophyllus græcus arboreus, Leucoii folio peramaro. *Tournef. It. v.* 1. 70, cum figurâ.—Nullo modo ab α differt, niſi foliis brevioribus, parum latioribus, & obtuſis.

23. D. *juniperinus*, caule fruticoſo, foliis ſubulatis, ſquamis calycinis ſubquaternis obovatis mucronato-pungentibus patulis tubo duplo brevioribus.
Caryophyllus creticus arboreus, Juniperi folio, *Tourn. Cor.* 23.
C. ſylveſtris arboreus, *Alpin. Exot.* 39, *t.* 38?

Habitat in Cretâ. *Tournefort.*

Caulis fruticoſus, cortice rimoſo lacero, ramoſiſſimus, ramuli apice densè folioſi; floriferi elongati, cum oppoſitionibus 2 vel 3 tantum foliorum, internodiis multo breviorum, teretes, glabri. *Folia* ſubulata, anguſtiſſima, mucronato-pungentia, canaliculata, margine lævi. *Flores* bini vel terni in apicibus ramulorum, pedicellati, parvi. *Calycis* ſquamæ obovatæ, obtuſæ, vix ſtriatæ, margine apiceque membranaceæ, mucrone pungenti, divaricato, brevi, terminatæ, tubo duplo breviores; tubus ſtriatus, dentibus acutis, margine haud membranaceis. *Petala* crenata & inciſa. *Styli* exſerti, capillares.

I have

I have taken the liberty of altering the arrangement of the Linnæan ſpecies in ſome degree, introducing my new ones as much as poſſible according to their affinities. D. pungens not being at all more ſhrubby than many others, reckoned by Linnæus herbaceous, is moſt conveniently placed near thoſe ſpecies, to which it is, in other reſpects, naturally allied.

XXIX. *The*

XXIX. *The Hiſtory and Deſcription of a Minute Epiphyllous Lycoperdon, growing on the Leaves of the Anemone nemoroſa. By Richard Pulteney, M. D. F. R. S. S. Lond. and Edin. and F. L. S.*

Read June 5, 1792.

IT is many years ſince I was firſt acquainted with the production, of which I now beg to lay an account before the Linnean Society. But, although it had frequently occurred to me, I had neglected to give it an accurate examination by means of glaſſes; having reſted in the opinion which I had met with in ſeveral modern authors, that thoſe *Tubercula*, or *Puncta*, as they have been moſt commonly ſtyled, on the leaves of the *Anemone nemoroſa*, were the eggs of an inſect.

An opportunity of ſeeing ſome of theſe plants early this Spring, put it in my power to give theſe appearances a more exact ſcrutiny; the reſult of which convinced me, that theſe tubercles were themſelves a vegetable production of a paraſitical kind, and of the order of *Fungi:* of which, it may be remarked, that very few ſpecies are known to vegetate on the perfect and living foliage, although many inhabit the dead and putrid leaves, of plants.

Before I deſcribe more minutely the Fungus in queſtion, I will briefly recite what I collect concerning the plant on which it is

found; which, on account of theſe tubercles, has, by ſome of thoſe botanical authors who wrote ſoon after the reſtoration of botany, been conſidered as a diſtinct ſpecies. Hence ſome account of the plant becomes neceſſary to illuſtrate the ſubſequent obſervations; ſince, if I miſtake not, ſome errors relating to it have remained undetected for upwards of two centuries.

After conſulting all the older authors which I have it in my power to refer to, I can find no one who notices the ſingularity obſervable in the leaves of the *Anemone*, prior to THALIUS, a phyſician of *Northauſen* in Germany; who appears to have been no inconſiderable botaniſt, at the period when he wrote. He with great diligence made a catalogue of the plants of the *Hartz*, or Black Foreſt, which was undertaken at the requeſt of CAMERARIUS, and publiſhed by him after the death of the author, under the title of *Sylva Hercynia*, in 1588. In this work the author deſcribes what he calls *Ranunculus Martii tertium Genus CORDI & TRAGI.* This genus he divides into five kinds or ſpecies, among which are included the *Anemone nemoroſa*, and *ranunculoides* of LINNÆUS, and the moderns. I have only to notice what he remarks of his *Quintum Genus*, of which, however, it is unneceſſary to detail his deſcription at large. It is ſufficient to obſerve, that he deſcribes it as being always a *ſterile* plant, and concludes with the following characteriſtic obſervation, which I give in his own words—"Hoc autem præ reliquis hujus "ordinis generibus folia hæc peculiare obtinent, quod in dorſo "frequentibus veluti ſtigmatibus, ſeu punctulis protuberantibus "ſint picturata exaſperataque." *Sylv. Hercyn.* p. 98.

Caſpar Bauhine, in his *Phytopinax*, p. 320. (which with reſpect to many of the plants is a more correct work than the Pinax itſelf) comprehends this variety under the ſynonyms of the *Anemone nemoroſa*, adding, "Eſt et qui in dorſo frequentibus punctulis protube-

"rantibus

"rantibus exaſperatur:" which obſervation *John Bauhine*, his laborious brother, repeats in the *Hiſtoria Plantarum*, tom. iii. p. 413. *Caſpar Bauhine*, again, in the *Pinax* itſelf, makes it his ſeventh ſpecies of the *Anemones ſylveſtres*, under the name of *Anemone nemoroſa ſterilis, foliis punctatis*, p. 177.

I find other authors alſo characteriſing this plant, as a variety of the *Anemone nemoroſa*, by the epithets or trivial adjuncts *ſtigmatoides*, *inſectorum vitium*, &c. Such are *Maurice* HOFFMANN, in his *Flora Altdorfina* in 1662, and BROMELIUS, in his *Chloris Gothica* in 1694. But not having an opportunity of referring to theſe authors, I am unable to ſay how far their obſervations extend. It ſeems, however, that HOFFMANN was the firſt who aſcribed theſe appearances to the work of inſects: but he does not ſay they were the eggs, but ſeems rather to conſider them as the effect of punctures only. MENTZEL, in his *Index Nominum Plantarum multilinguis*, printed in 1682, records it under the name of *Ranunculus nemoroſus ſtigmatoides*, p. 258. But, in his *Pugillus rariorum Plantarum*, he goes much farther, and caught the idea of its reſemblance to a Fern. "Hic abſque flore creſcit, et folia ſubtus tamque rubigine adſperſa, "habet quaſi in capillarem plantam degener." By this deſcription it evidently appears, that MENTZEL had examined the plant in the mature ſtate of theſe *Fungilli*, when indeed it bears a notable reſemblance to a ſmall Fern. The root of the *Anemone nemoroſa* is known to creep in a horizontal direction; and MENTZEL obſerves, that, unlike to the *flowering* ſpecies, which puts forth the leaf from the middle of the root, this *ſterile* plant always ſends up the ſtalk from one of the extremities. I mention this, ſince a few obſervations of my own, made by digging up the roots, tend to confirm the remark of this author. He notices further the length of the footſtalk or petiole, which, with a paleneſs of the leaves,

diſtinguiſh theſe plants, at firſt ſight, from the flowering plants of this kind.

Among the writers of our own country, Mr. Ray firſt records the plant as a variety under *Caſpar* BAUHINE's name from the *Pinax* as above quoted; to which he adds, "Anemones ſylveſtris ſpecies "degener eſſe videtur." *Hiſt. Plant.* i. p. 624. Thus ſtood the matter until the publication of the third edition of RAY's *Synopſis*, by DILLENIUS; when a leaf of this *Anemone*, laden with theſe tubercles, which had been found by DILLENIUS, in BOBART's *Hortus Siccus*, had ſo far impoſed upon the Profeſſor, that he judged it to be a new ſpecies of Fern *, and introduced it into the *Synopſis* under the name of *Filix lobata globulis pulverulentis undique aſperſa*, p. 125. *tab.* 3. *fig.* 1.

Whether Dr. HILL himſelf detected this error of Dillenius I am not informed; but as far as I know he was the firſt who revealed it, in his *Britiſh Herbal*, publiſhed in 1756, p. 12. and this with a flippancy of remark every where too conſpicuous throughout that work, and which, in this inſtance, does leſs credit to his own candour and ingenuouſneſs, than it detracts from the accuracy of Dillenius, whom he tacitly endeavours to ridicule, under the appearance of reſcuing the memory of Ray from the imputation of this error, although he muſt have known that no botaniſt could place it to Ray's account. I make this obſervation, becauſe, in reality, it is as little wonderful that the plant, without the help of glaſſes, ſhould, from theſe tubercles, have been miſtaken for a Fern, if viewed when the *Fungi* were in their laſt period, verging to decay, as that, in their younger ſtate, they ſhould be miſtaken for the eggs of an inſect. Dr. Hill himſelf probably might have ſeen the

* Since the above was written I am enabled to add, by information from the preſent learned Profeſſor of Botany at Oxford, that he has ſeen among *Dillenius*'s papers a correction of the miſtake by *Dillenius* himſelf. June 1793.

plant

plant in the latter ſtate, ſince his detection of the error (if it was his own) was but partial; he having, after all, conſidered the *puncta* as being effected by inſects. He actually ſays, that "a ſmall winged "inſect is apt to depoſit its eggs on the under part of the leaves "of this ſpecies," (ſpeaking of the *Anemone nemoroſa*) "and they "ſomewhat reſemble the round dots in which the ſeeds of fern "are lodged." What degree of credit is due to this account, will be manifeſt from the ſubſequent hiſtory of the plant.

Although after this time neither HUDSON, LIGHTFOOT, MARTYN, LYONS, RELHAN*, nor any other author takes notice of this *Filix lobata*, yet ſome foreign writers of the moſt reſpectable note continued to advance the old opinion relating to theſe appearances on the leaves of the *Anemone*. "Foliis ſtigmatibus ex inſectorum ictu notatis," are the words of HALLER, *Hiſt. Plant. Helv. tom.* ii. p. 64; and the accurate POLLICH, in his *Hiſtoria Plantarum Palatinatûs electoralis*, adds, when ſpeaking of this plant—"Variat quoque ubi folia mi-"nora ac latiora erant, lobata, ſubtus punctis nigris conſperſa, quæ "ab inſectorum ictu naſcuntur."

After having thus traced the hiſtory of this production down to the preſent time, I muſt obſerve, that, although it would be unwarrantable in me to aſſert that no inſect ever depoſits its eggs on the under ſide of the leaves of the *Anemone nemoroſa*, yet I ſuſpect that the want of a preciſe examination of theſe *puncta* has been the ſole reaſon of perpetuating an error, and that theſe *puncta*, whenever found, have been in reality, not of animal, but of vegetable origin: and I cannot help preſuming that the deſcription I ſhall give, and the reaſons hereafter alleged, but above all a view of the plant itſelf, which I herewith ſubmit to the inſpection of the Gentlemen of the Society, will ſufficiently eſtabliſh this opinion.

* *Aecidium fuſcum.* Relh. Cant. Suppl. iii. 36.

Before

Before I had examined these appearances more minutely, and with glasses, I had indeed doubted whether they were owing to the operation of, or were indeed the eggs of insects, from the circumstance, among others, of their being always found sparsedly placed on the leaf, and not in the aggregated mode, as insects *usually* deposit their eggs. A favourable opportunity, this Spring, of seeing some of these leaves loaded with tubercles, confirmed my suspicions that they were not the eggs, the punctures, or even the work of insects, in any way whatever. Upon examining them with one of Mr. Adams's pocket lenses of three glasses united, I observed, that these tubercles were not merely placed on the outer coat, but that they originated beneath the cuticle or external film of the leaf; and that the young white *Fungus* might be discerned through this thin green coat. Others were seen just emerging with the coat of the leaf lacerated, and spread on the side of the *Fungus*. On each leaf they are very often seen in different stages of growth; some just appearing, others out, and with a puncture, or pore, just discernible on the top, which is the beginning of the aperture, that by and by enlarges, and the whole assumes a globular cup-like form, with lacerated edges, the cavity being lined with white dust, among which minute fibres or filaments may be discerned. When the *Fungus* fades, it becomes, from being perfectly white, first yellowish, then brown, and finally, each *Fungus* is resolved into a farinose particle resembling the fructification of a Polypody. This minute *Fungus* is somewhat allied in its habit to the *Lycoperdon epiphyllum* LINNÆI, as found on the leaves of Colts-foot; but differs in not being aggregate, nor of an orange colour. Some of them, at a certain stage of growth, bear some resemblance to the figures of the *Carpobolus* E. F. tab. 101. in the *Genera Plantarum nova* of MICHELI; but the edges are lacerated in our *Fungus*, and not in any instance divided into smooth-

edged,

edged, regularly ſhaped ſegments, like thoſe of the above-mentioned figures; neither have I, as yet, obſerved the appearance of a *Volva*. To this may be added, that, during all its ſtate of growth, and at maturity, it preſerves uniformly a white colour, changing when dead into a yellowiſh brown.

As far as my obſervations extend, I judge, that this *Fungus* is ſeldom found on full grown, vigorous, and perfect, or flowering plants; but on the leaves of ſeedling plants, or of the firſt year's growth. The plants on which it is found are uſually ſmaller than the others, the leaves of a paler colour, and the footſtalk more lengthened, the whole giving the idea of a weakened or morbid ſtate: but whether theſe *Fungilli* render the plant always *ſterile*, an epithet which *Caſpar* BAUHINE and other ancient authors have applied to it, or whether they occupy it in conſequence of its having become morbid, I do not decide *.

Having made my earlieſt obſervations on this *Fungus*, when in its younger ſtate of growth, and cup-like form, I heſitated whether it ſhould be ranked with the *Peziza* or *Lycoperdon* genus: but in marking its progreſs to its old and decaying ſtate, there remained no longer any doubt in which genus it ought to be claſſed. I judge it may not unaptly be named and deſcribed as follows:

NOMEN.

Lycoperdon *(Anemones)* paraſiticum ſphæricum ſeſſile diſcretum album; ore multifido lacero; pulvere albo.

DESCRIPTIO.

Tubercula virideſcentia, diſcreta, magnitudine inter ſe nec multum diſcrepantes, intra folii cuticulam primùm diſcernuntur: mox erumpunt fungilli albi, mammiformes, poro in ſummitate notati:

* Mr. Relhan obſerved the contrary.

ſenſim dehiſcunt in cyathos urceolatos ſive orbiculatos albiſſimi coloris; marginibus ſubæqualibus in lacinias numeroſas ſectis. Cavitas dum matureſcunt fungilli, pulpa, ſive lanugine filamentoſa, pulverem album fundente, repletur. Vacuo per maturitatem demum cyatho, pulvis per totum folii diſcum diſpergitur. Seneſcens, flaveſcentem, et per ætatem extremam ſubfuſcum, induit colorem: totus demum fungillus in cæſpitem quaſi vel globulum farinoſum, nigreſcentem, filicum, vel ſpecialiter polypodii, fructificationem æmulantem, contabeſcit.

Lycoperdo epiphyllo *Linnæi*, in pagina inferiore Tuſſilaginis Farfaræ folii, creſcenti, affine, ſed non idem; differt enim quod diſcretum ſemper nec aggregatum. Color albus, nec aurantius; quod cyathi margines nec in octo tantum vel novem lacinias ſecti, ſed plurimas et irregulares.

LOCUS.

Habitat in dorſo *Anemones nemoroſæ* foliorum virentium.

TEMPUS.

Verno viget tempore, dum planta cui inſidet, vireſcit. Juniora folia plantarum fortè annotinarum, potiſſimùm videtur occupare hic fungus; et plantam, ut ſuſpicor, ſterilem eſſe reddit. Sparſim et ſine ullo ordine, dorſo folii ſolum, innaſcitur, inter omnes ejuſdem generis, minimus hic fungulus; neque confluens neque aggregatus, rarius enim duo contigui videntur. Decem, quindecim, vel viginti, immo etiam triginta ſæpè plura, ad centum rarius, in uno foliolo numerantur.

XXX. *Extract of a Letter from Mr. John Lindsay, Surgeon in Jamaica, to Sir Joseph Banks, Bart. P. R. S. and H. M. L. S. dated June* 30, 1792.

Read April 2, 1793.

SIR,

IN my last letter I mentioned I had sown some of the fine dust or farina from the fructification of *Lycopodium cernuum*, and that from the capitula, generally called antheræ, of *Bryum cæspititium*, or a species very like it, but I then thought their success somewhat doubtful. I have since repeatedly sown them both, and in a proper situation find they grow very readily.

Encouraged by this, I sowed that curious part of the fructification of *Marchantia polymorpha*, composed of fine elastic filaments and small globules (commonly considered as the male parts), where none of these plants had ever been before. In a short time I found there several young *Marchantiæ*, which are now growing freely. I lament I could not get any of the genus *Equisetum*, for a similar trial; but am much inclined to believe that the farina, from its fructification, will likewise produce young plants.

From these instances of young plants being produced from those parts of the fructification of Cryptogamous plants which have been, as far as I have been informed, hitherto considered as

as the male parts, I have little doubt but it would be found on a fair trial that, in a very great proportion of Cryptogamous plants, the real female parts have been miſtaken for the male.

In this view the *Marchantia* bearing ſeeds of another kind in ſmall ſeſſile cups, which alſo readily grow, may give the appearance of unneceſſary ſuperfluity; but in this reſpect the *Marchantia* is not ſingular. May not this laſt kind of ſeeds be conſidered as in ſome meaſure analogous to thoſe luxuriant productions of young plants in many vegetables (hence called viviparous) in place of ſeeds, rather than as a neceſſary part of the genuine fructification? Such examples are frequent in the tribe of *Gramina*, in the genus *Allium*, and others, and alſo among the Cryptogamous plants. There is a fern here, ſeeming a *Pteris*, growing by the edges of ponds, which is plentifully propagated by the falling of the leaves loaded with young plants into the water; yet this has its fructification and ſeeds in the uſual manner, and the ſeeds readily grow.

ADDITIONAL REMARKS,

By JAMES EDWARD SMITH, *M. D. P. L. S.*

THE foregoing obſervations of Mr. Lindſay are highly worthy of attention, as confirming the Hedwigian theory of the fructification of moſſes; and the reſult of his experiment on the *Bryum* was the ſame with thoſe made on the ſame genus by Hedwig.

The raiſing of any ſpecies of *Lycopodium* from its farina has not to my knowledge been deſcribed as practicable; Mr. Lindſay, there-

therefore, has all the merit of an original obſerver. It is not to detract from his due praiſe, but to do juſtice to unoſtentatious ingenuity, that I now mention Joſeph Fox, a journeyman weaver of Norwich, as having made ſimilar experiments upon *Lycopodium Selago* with the like ſucceſs. He ſhewed me, in the year 1779, young plants of this ſpecies raiſed from ſeed in his own garden. This humble obſerver, whoſe name has not yet appeared in any book, is the original diſcoverer of many rare plants in the county of Norfolk, and it is with pleaſure I commemorate his former aſſiſtance to myſelf.

XXXI. *Descriptions of Three New Species of Hirudo. By the Reverend William Kirby, A. L. S. With an additional Note by G. Shaw, M. D. F. R. S. and F. L. S.*

Read May 7, 1793.

BEING desirous of adding my mite to the treasures of the Linnean Society, I take the liberty of offering a description of three species of Hirudo, which appear to me to be non-descript.

1. Hirudo alba.

H. depressa alba interaneis fuscis ramosis, margine crispante, extremitate acutiuscula.

Description.—The H. alba is a species of singular beauty. Its colour is a most delicate white, which is interrupted by the elegant ramifications of the viscera, or interanea as Linnæus has termed them.

* These have the appearance of some of the most beautiful fuci. They begin a little behind the eyes (of which there are only two) in a point, and, proceeding as it were from a common rachis, grow gradually wider and wider till they arrive at the ovary where the rachis ends; but the ramifications parting off on each

* This elegant appearance of the viscera is lost when the worm is deprived of its proper nourishment. It then becomes entirely white.

side

ſide ſurround the ovary, behind which they unite again, and terminate in a point at the tail.

The ovary itſelf is of an oblong form, and generally pointed at the ends. In it are uſually two ſpots which have a luminous appearance. It contains three or four roundiſh eggs*.

This ſpecies aſſumes a variety of forms: when at reſt it is ſomewhat ovate, but when in motion it becomes linear.

The margin is white, and very tranſparent, affording an elegant contraſt to the interanea. At reſt it is uſually criſped, and frequently exhibits the appearance of many angular projections. Theſe are ſometimes reduced to four, of which two form a kind of hunch, one on each ſide, juſt below the head, and two juſt above the tail, which gives the little animal a very ſingular form. At other times its contour is indented by many ſinuoſities.

The extremity of the tail, though naturally acute, is ſometimes ſo contracted as to appear rounded. Its motion is uniform.

When in motion it is uſually between ſix and eight lines in length.

Found amongſt the Lemna gibba, in the Autumn, in a ſlow ſtream.

2. H. NIGRA.

H. depreſſa nigra linearis abdomine nigro.

Deſcription. This ſpecies is entirely black, of a deep rich colour like velvet, except that juſt above the tail there is uſually a ſemi-pellucid ſpot of a whitiſh caſt†.

* Upon examining one of theſe eggs ſub lente, I diſcovered two black points upon it exactly ſimilar to the eyes of the old one: whence perhaps it was a fœtus, and this ſpecies viviparous.

† The whole worm, when kept long in water in a glaſs, ſeems to incline to an aſh colour; occaſioned perhaps by the want of its proper food.

I never

I never could diſcover that it had any eyes. When at reſt it is nearly circular, but when it moves it becomes linear; and then the centre of the head is uſually protended into an obtuſe angle.

Its motion (if I may ſo expreſs myſelf) is *beautifully* ſmooth and uniform; and it is a very amuſing ſight to obſerve theſe little creatures, in a clear ſhallow ſtream, on a calm day, by myriads ſmoothly gliding over its bed.

At reſt it is ſeldom above one line in length, but extends itſelf to three when it moves.

Found in ſlow ſtreams, I believe almoſt the whole year, upon aquatic plants.

3. H. CRENATA. Tab. 29.

H. ſubdepreſſa ſubovata ſtriata ſtriis tranſverſis *annularibus*? margine crenulato.

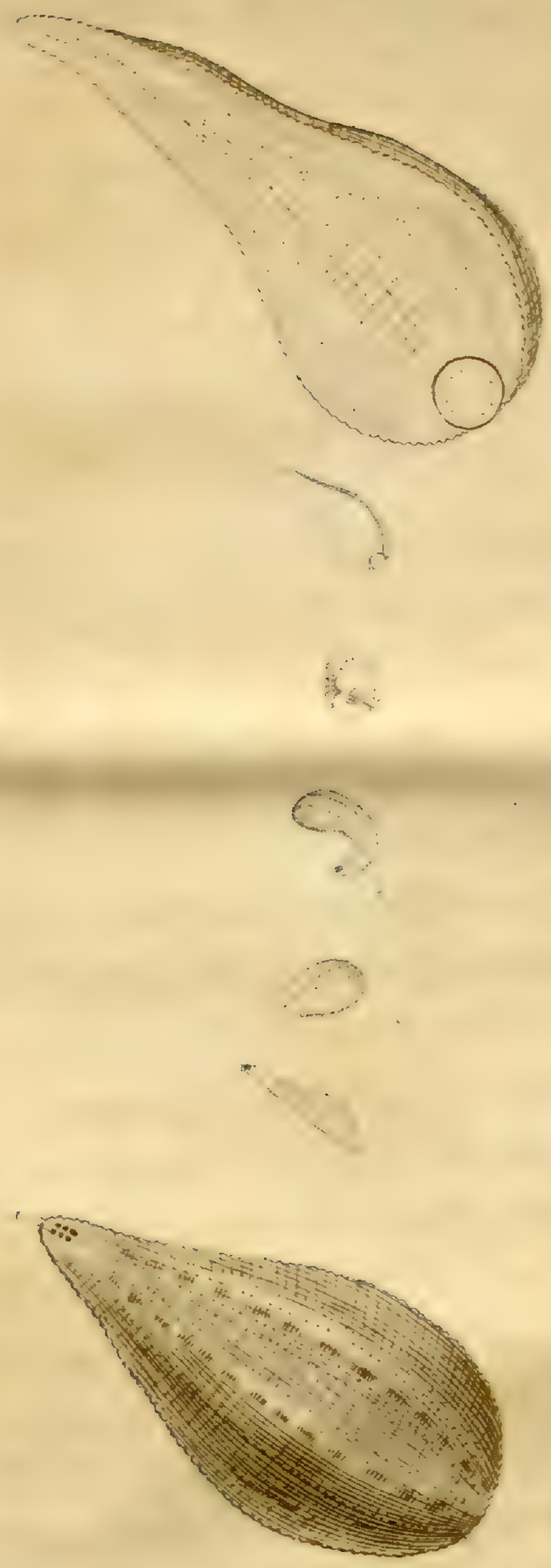
Deſcription.—This ſpecies is of a greeniſh caſt, ſometimes inclining to aſh-colour. It is tranſverſely ſtriated with annular ſtriæ, from whence ariſe the crenatæ of its margin.

Its upper ſurface is ſomewhat convex. Its interanea are very viſible by means of its vitreous tranſparency; they appear like ſo many ſeparate granula. Its excrements I have ſometimes ſeen appended to the anus, its form exactly reſembling the interanea; they appeared to adhere to the worm, and to each other, by means of a gelatinous tranſparent excretion, which hung in places in oblong guttulæ.

It has two eyes only, which are very much approximated.

Its motion is very ſimilar to that of the larvæ of the geometræ, and is performed by means of the adheſive property of the head and the tail. The tail being fixed to the ſides of the glaſs, it extends

Linn. Trans. II. tab. 29. f. 318.



Hirudo crenata

tends its head to a point at the greateſt diſtance from the tail where it adheres; then bringing its tail into contact with its head, it contracts itſelf into a hemiſpheric form, and by this mean moves very faſt.

It has alſo another action in which it reſembles the larvæ of the geometræ. When diſturbed, it fixes itſelf by its tail, and then, raiſing itſelf perpendicular to the plane of poſition, moves its head from ſide to ſide, ſupported merely by the expanded adheſive orb of the tail.

I found this with the preceding ones, but it ſeems a rarer ſpecies.

Obſervation.—The Hirudo *alba* and *nigra*, as alſo the *viridis* of Dr. Shaw, appear to me not rightly referred to this genus, as they by no means agree with the Linnean definition. Corpus oblongum *ore caudaque in orbiculum expandendis ſe promovens*. The motion of theſe three ſpecies is uniform and equable, nor do they poſſeſs that orbicular adheſive expanſion of the head and tail which conſtitutes the eſſential diſtinction of the genus Hirudo. Qu. Are they ſufficiently diſtinct to conſtitute a new genus?

ADDITIONAL NOTE,

By Dr. Shaw.

THE *Hirudo nigra* of Mr. Kirby I believe to be the *Planaria fuſca* of Pallas and Gmelin, Syſt. Nat. p. 390.

The *Hirudo alba* of Mr. Kirby is probably the *Planaria lactea* of Gmelin, deſcribed by Müller in the *Zoologia Danica*; and in the *It. Gothl.* it is conſidered by Linnæus as a *Hirudo*.

The

The *Hirudo crenata* of Mr. Kirby ſhould ſeem by his deſcription to be extremely near allied to the *Hirudo geometra* of Linn. and perhaps may be the ſame ſpecies in a young ſtate.

Mr. Kirby's obſervation relative to theſe animals forming a diſtinct genus from *Hirudo* is unqueſtionably right, for in fact they are real *Planariæ;* and even the ſpecies deſcribed in the Linnean Tranſactions by the title of *Hirudo viridis* comes ſo near to the *Planaria punctata, viridis,* and *Helluo,* that it may be doubted whether it be really diſtinct, or a variety.

TAB. 29.

Exhibits the *Hirudo crenata,* in ſeveral different views, of its natural ſize, with two magnified.

XXXII. *Additional Obſervations on Fucus Hypogloſſum, p.* 30. *By T. J. Woodward, Eſq. F. L. S.*

Read June 4, 1793.

IN the paper read before this Society, in which *Fucus Hypogloſſum* is deſcribed, it is mentioned that this ſpecies was ſo named by the late ingenious Dr. Solander; but that, his papers on the genus *Fucus* being loſt, no information from him could be met with on the ſubject. Since that time, theſe valuable manuſcripts have been recovered by the diligence of Mr. Dryander and Mr. T. F. Forſter jun. and are now ſafely depoſited in the library of Sir Joſeph Banks.

It was not till after the ſheet containing my account of this *Fucus* was gone to preſs, that I received information of this diſcovery; when Sir Joſeph Banks not only permitted me freely to examine and make extracts from theſe papers, but allowed me to make ſuch uſe of them as might be neceſſary to elucidate this or any other of the Britiſh *Fuci*. In conſequence of this permiſſion, I now lay before the Society Dr. Solander's ſpecific character and obſervations; premiſing, that being in doubt whether the plant was dioecious or not, the Doctor has deſcribed it as two diſtinct ſpecies, but remarking, that they were probably to be conſidered as male and female of the ſame ſpecies.

Fucus Hypogloſſum,

Caule alato ramoſo, foliis planis lanceolatis acutis è coſtâ proliferis, fructificationibus ſeriatis utrinque ad coſtam diſpoſitis.

Habitat in oceano Anglicano Cornubienſi, et propè Inſulam Vectis.

Ruber, ſæpè ſpithamæus, tener, membranaceus. Coſta frondes etiam tenerrimas percurrit uti in *Fuco lingulato* Manuſcripti, à quo differt foliis longioribus acutis, et præcipuè fructificationibus minutiſſimis, ſeriatim in lineas utrinque ad coſtam diſpoſitis.

Fucus lingulatus,

Caule alato ramoſo, foliis planis lanceolatis obtuſis è coſtâ proliferis, fructificationibus globoſis ſolitariis coſtalibus.

Habitat in oceano Anglicano Cornubiam alluente, et propè Inſulam Vectis.

Ruber, parvus, tener, membranaceus, vix palmaris. Caulis ſeu coſta à radice per ramulos ultimaque folia extenditur, è quâ folia ſeu frondes teneriores excreſcunt.

Fructificationes etiam è coſta erumpunt.

An fœmina Fuci hypogloſſi Manuſcripti?

It is to be obſerved, that the ſpecific characters, as above given, differ only in the leaves being acute or obtuſe, and in the fructification; and at the end of the note on *F. lingulatus*, Dr. Solander expreſſes his doubts whether this be not the female of *F. Hypogloſſum*. It is probable that he afterwards conſidered it abſolutely as ſuch, as no ſpecimen of *F. lingulatus* is to be found in Sir Joſeph Banks's Herbarium, unleſs a ſmall one on the ſame paper with *Hypogloſſum*, but unnamed, be ſuppoſed to be what was originally called

called ſo; which from the circumſtances I am induced to think it was, and that the Doctor was afterwards ſatisfied they were not diſtinct. This ſpecimen has unfortunately no fructification, which, had it been preſent, would have cleared up all doubts, as the ſpecimen of *Hypogloſſum* has the fructification deſcribed in the ſpecific character. Since my deſcription was written, I have had occaſion to obſerve, that the leaves of *F. Hypogloſſum* vary extremely in ſhape; ſome being almoſt linear, whilſt others are linear-lanceolate, or lanceolate; and in ſome ſpecimens they are to be ſeen approaching to oval.

I have now reported this matter to the Society, and requeſt they will permit it to be printed in the preſent volume of their Tranſactions, that the public may be informed that the manuſcripts of Dr. Solander, which I had ſtated to have been miſſing, are now recovered. This I am the more anxious to do, leſt, from the general agreement between the ſpecific character and deſcription as given by Dr. Solander, and my own, it might be ſuſpected that I had made uſe of his notes, not only without acknowledgment, but for my own purpoſes declaring them to be loſt, when they were actually in exiſtence. I am happy therefore in knowing, that, however flattering this coincidence muſt be to me, the teſtimony of Mr. Dryander and Mr. Forſter will be amply ſufficient to acquit me from any charge of plagiariſm.

Additional Note to the Eſſay on the Stellated Lycoperdons, referred to L. recolligens, at p. 58. *By the ſame.*

AT the time this Eſſay was written, the Hiſtoire des Champignons of Mr. Bulliard was not publiſhed, nor was his pl. 471 extant,

where this ſpecies is excellently figured; M N repreſenting the ſmall and more common, and L the larger, and (with us) ſcarcer variety. The few and equal rays, and the depreſſed ſeſſile capitulum, convinced me inſtantly, on inſpection, that the *Lycoperdon* there figured could be no other than the *recolligens;* but had I doubted, the obſervation, tom. 1, p. 161, where the author ſpeaks of the hygrometric properties of his plant (to which the *L. ſtellatum* has no pretenſions), muſt have carried abſolute conviction with it. Pl. 238, of the ſame author, I am now certain, repreſents the ſame ſpecies, though the figures are not ſo good. Theſe plants had not, at the time of publiſhing that plate, fallen much under Mr. Bulliard's obſervation, or he would not have attributed the returning of the rays over the capitulum as expreſſed fig. H. to decay through age, which his ſubſequent obſervations informed him was owing to the hygrometric quality of the plant. This ſeems to be the only ſtellated *Lycoperdon* at preſent known in France, and therefore it is not to be wondered at that he has confounded it with *ſtellatum*.

XXXIII. *Additional Remarks on the Wood Sandpiper, Tringa glareola.* By *William Markwick, Esq. F. L. S.*

Read June 4, 1793.

WHEN my deſcription and figure of this bird were communicated to the Linnean Society, and which they thought proper to publiſh in the firſt volume of their Tranſactions, I thought it, on the authority of Meſſrs. Pennant and Latham, a diſtinct ſpecies, and a new diſcovery as a Britiſh bird; but, having ſince been favoured by Mr. Latham with ſome letters on the ſubject, and alſo a dried ſpecimen of the *Tringa ocropus* (a bird that I had not ſeen before), I have little or no doubt that the *Tringa glareola* is a mere variety of that bird; for, according to my recollection of the bird, and on comparing the *Tringa ocropus* with my deſcription and figure, they appear to agree very nearly in ſize and dimenſions, the principal difference conſiſting in the colour of the plumage on ſome parts, which may probably be occaſioned only by difference of ſex or age.

XXXIV. *Botanical Obſervations on the Flora Japonica. By Charles Peter Thunberg, Knight of the Order of Waſa, Profeſſor of Botany and Medicine in the Univerſity of Upſal, F. M. L. S.*

Read Oct. 1, 1793.

INCRESCUNT quotannis Scientiæ, emendantur quotidie et ad faſtigium ſuum optatum ſenſim ſenſimque, plurium virorum opera et ſtudio junctis, feliciter properant. Deteguntur novæ terræ, novæque naturæ gazæ innoteſcunt, atque humano generi utiles evadunt. Sic non parum aucta fuit, præteritis et currentibus annis, Scientia Botanica, nec pauca ſunt, quæ in uſum et commoda mortalium indagarunt alacres peregrinatores et Scientiæ cultores indefeſſi. Poſtquam et mihi, plurium poſt annorum itinera reduci, anno 1784, in Flora Japonica Plantas Niponiæ deſcriptas publici juris facere contigiſſet, illas ulteriori examini, et accuratiori ſcrutinio ſubinde ſubjeci atque plura in hiſce emendanda inveni. Has a me factas obſervationes, ne Scientiæ amatoribus lateant diutius, Illuſtri Societati, pro Hiſtoria Naturali promovenda inſtitutæ, deque illa dudum bene meritæ, devotiſſime offero.

ORCHIS *radiata:* bulbis indiviſis, nectarii alis amplioribus ciliatis.
Orchis ſuſannæ. Flor. Japon. p. 25.

LIMODORUM *falcatum:* cornu filiformi longiſſimo, foliis enſiformi-canaliculatis falcatis.
Orchis falcata. Flor. Japon. p. 26.

LIMODO-

LIMODORUM *monile*: scapo tereti striato moniliformi-articulato simplici, foliis linearibus acutis.

Epidendrum monile. Flor. Japon. p. 30.

Japonicè: Sekikokf et Fu Kan. Kæmpf. Am. exot. fasc. v. p. 864. tab. 865.

Planta terrestris.

Vaginæ foliorum pluribus costis notatæ.

EPIDENDRUM *nervosum*: scapo angulato, foliis ovatis nervosis, labello integro reflexo.

Ophrys nervosa. Flor. Japon. p. 27.

EPIDENDRUM *striatum*: scapo angulato glabro, foliis ensiformibus nervosis, petalis lanceolatis, labello oblongo plano.

Limodorum striatum. Flor. Japon. p. 28.

Distincta planta à Limodoro striato, Kæmpf. Icon. Sel. tab. 2.

EPIDENDRUM *ensifolium*: scapo tereti lævi, foliis ensiformibus striatis, petalis lanceolatis, labello recurvo latiore.

Limodorum ensifolium. Flor. Japon. p. 29.

Limodorum ensatum. Kæmpf. Icon. Sel. tab. 3.

Cornu huic nullum.

FICUS *erecta*: foliis oblongis acutis glabris subtus reticulatis, caule decumbente ramis erectis, fructibus pedunculatis.

Ficus erecta. Differt. Thunb. de Ficu, p. 9. Kæmpf. Icon. Sel. t. 4.

Ficus pumila. β. Flor. Japon. p. 33.

FICUS *stipulata*: foliis oblique cordatis obtusis glabris, caule decumbente squamoso.

Ficus stipulata. Differt. Thunb. de Ficu, p. 8.

IRIS *japonica*: barbata, foliis ensiformibus falcatis brevioribus glabris, scapo compresso multifloro.

Iris squalens. Flor. Japon. p. 33.

Japonicè:

Japonicè: Saga et Siaga. Kæmpf. Amoen. Exot. fasc. 5. p. 872.
Scapus compressus, articulatus, striatus, glaber, erectus, pedalis.
Folia ensiformia, equitantia, falcata, nervosa, glabra, scapo breviora.
Spathæ sub floribus foliis similes, obversæ, sensim breviores.
Flores axillares ex axillis spatharum.
Corollæ 1-petalæ, albæ, barbatæ.

IRIS *orientalis*: imberbis, foliis linearibus, scapo sub-bifloro tereti articulato, germinibus trigonis, corollis reticulatis.
Iris sibirica. Flor. Japon. p. 33.
Scapus teres, striatus, glaber, articulatus, erectus, pedalis vel ultra.
Folia radicalia, linearia, equitantia, nervosa, glabra, apice attenuata, scapum æquantia.
Spathæ foliis similes, sensim breviores.
Flores circiter bini, subterminales.
Corolla imberbis, fusco-reticulata.

IRIS *sibirica*: imberbis, foliis linearibus, scapo sub-trifloro tereti, germinibus trigonis.
Iris sibirica. Linn. Syst. Veg. xiv. p. 91.
Japonicè: Koots Tsta.
Scapi et *folia* basi cæspitosa.
Flores cærulei.

IRIS *ensata*: imberbis, foliis linearibus, scapo sub-bifloro tereti, germinibus hexagonis.
Iris graminea. *Flor. Japon.* p. 34.
Scapus teres, nec anceps.
Germen hexagonum.

SACCHARUM *japonicum*: racemis fasciculatis, petalis ciliatis: exterioribus aristatis.

Saccharum polydactylon. Flor. Japon. p. 42. excluſo ſynonymo Linnæi.

CENCHRUS *purpuraſcens*: racemo ſpicato ſimplici, floſculis circumvallatis ariſtis longiſſimis, culmo erecto.

Panicum hordeiforme γ. Flor. Japon. p. 48.

Culmus erectus, bipedalis.

Folia culmo longiora.

Racemus ſubſpicatus, laxus, ſpithamæus, pedunculis longitudine floſculorum diſtiche patulis.

Ariſtæ purpureæ, floſculo ſexies longiores.

QUERIA *trichotoma*: floribus racemoſis, caule trichotomo.

Rubia ſpicis ternis. Flor. Japon. p. 357. N° 44. inter obſcuras.

VISCUM *japonicum*: caule prolifero ramoſo aphyllo: articulis trigonis.

Viſcum opuntia. Flor. Japon. p. 64.

Rami dichotomi: articuli trigoni, oblongi, compreſſi, vix unguiculares, ſenſim minores, rugoſi.

FAGARA *horrida*: foliis pinnatis: pinnis ovatis crenatis, ſpinis ramorum ſpinoſis.

Fagara foliolis inæquilateris integris. Flor. Japon. p. 350. N° 3.

Japonenſibus: Sai katſi.

Rami flexuoſi, erecti, cinereo-purpuraſcentes, elongati, glabri, ſubſimplices.

Spinæ ſparſæ, rigidæ, purpuraſcentes, patentes, pollicares, armatæ *ſpinulis* alternis, patentibus, minoribus.

Folia è gemmis plura, pinnata: *Pinnæ* oppoſitæ, ſubſeſſiles, multijugæ, ovatæ, obtuſæ, tenuiſſime crenatæ, glabræ, virides, unguiculares.

Flores et *fructus* non vidi.

BOEMERIA *spicata*: foliis oppositis ovatis acutis serratis glabris, spicis capillaribus interruptis.

Urtica spicata. Flor. Japon. p. 69.

Urtica japonica. Linn. Supp. p. 418.

Acalypha japonica. Houtuyn Nat. Hist. P. 2. tab. 72.

BOEMERIA *frutescens*: foliis alternis oblongis cuspidatis subtus niveis.

Urtica frutescens. Flor. Japon. p. 70.

Frutex urticæ foliis et facie, floribus crystallinis. Flor. Japon. p. 367. N° 98. huc referendus.

CONVOLVULUS *Nil*: foliis trilobis cordatis, pedunculis unifloris.

Ipomœa triloba. Flor. Japon. p. 86.

Differt ab Ipomœa *triloba* corolla campanulata, floribus solitariis, caule tereti, foliis pubescentibus.

LONICERA *flexuosa*: floribus subsessilibus, baccis distinctis, foliis ovatis integris glabris, caule flexuoso.

Lonicera nigra. Flor. Japon. p. 89.

Rami divaricati, flexuoso-erecti, teretes, villosi.

Folia opposita, petiolata, ovata, margine reflexo integra, nervosa, glabra, nervis parum villosa, pollicaria, superioribus minoribus.

Flores axillares, breviter pedunculati pedunculis vix lineam longis.

Baccæ distinctæ, ovatæ, acuminatæ, nigræ.

LOBELIA *radicans*: foliis lanceolatis undulatis serratis, caule decumbente radicante.

Lobelia Erinus. Flor. Japon. p. 325.

Caulis herbaceus, decumbens, radicans, ramosus, filiformi-angulatus, glaber.

Rami

Rami rariores, erecti.

Folia alterna, lanceolata, ſeſſilia, decurrentia, undulata, ſubdentata, patula, glabra, unguicularia.

Flores axillares, ſolitarii.

Pedunculi uniflori, folio duplo fere longiores.

LOBELIA *campanuloides:* foliis ſubpetiolatis lanceolato-oblongis dentatis, caulibus decumbentibus, pedunculis elongatis.

Lobelia erinoides. Flor. Japon. p. 326.

Caulis decumbens, ſub-ſimplex, elongatus, filiformis, ſtriatus, glaber, pedalis et ultra.

Folia alterna, ſubſeſſilia, lanceolata, acuta, obſolete ſerrata, glabra, patentia, ſub-pollicaria.

Flores terminales in ramis elongatis.

WEIGELA *japonica:* foliis ſeſſilibus ovato-lanceolatis.

Weigela japonica. Flor. Japon. p. 90.

Japonice: Sima utſugi et Nippon utſugi. Kæmpf. Am. Exot. faſc. v. p. 855.

Folia ſeſſilia, lanceolato-ovata, pollicaria.

Petioli nulli.

WEIGELA *coræenſis:* foliis petiolatis obovatis.

Japonice: Korei utſugi. Kæmpf .Am. Exot. faſc. v.—p. 855. Icon. Select. tab. 45.

Rami decuſſati, glabri, cinerei, erecto-patuli.

Folia petiolata, obovata, ſerrata, acuminata, palmaria.

Petioli amplexicaules, ſub-pollicares.

BLADHIA *glabra:* foliis oppoſitis ſerratis glabris, caule erecto.

Bladhia foliis ſerratis glabris lævibus. Flor. Japon. p. 350. N° 5.

Differt ab hac Bladhia *japonica*, foliis ternis ſerratis glabris, caule baſi decumbente.

CELASTRUS *ſcandens*: inermis ramis ſcandentibus punctatis, foliis ovatis ſerratis.

Celaſtrus punctatus. Flor. Japon. p. 97.

CELASTRUS *dilatatus*: foliis obovatis cuſpidatis apice ſerratis glabris, caule inermi.

Evonymoides baccis parvis. Flor. Japon. p. 354. N° 26.

VITIS *flexuoſa*: foliis cordatis dentatis, ſubtus villoſis, caule flexuoſo, paniculis elongatis.

Vitis indica. Flor. Japon. p. 103.

Petioli filiformes, unguiculares.

Paniculæ abſque cirrhis.

VIBURNUM *plicatum*: foliis ovatis obtuſis dentato-ſerratis plicatis.

Viburnum dentatum. Flor. Japon. p. 122.

Flores radiati.

Folia magis rotunda, et dentes teneriores quam in V. *dentato*.

COMMELINA *japonica*: foliis ovato-lanceolatis undulatis, caule erecto angulato piloſo, floribus paniculatis.

Caulis ſulcatus, erectus, piloſus, apice paniculatus, pedalis.

Folia alterna, vaginantia, oblonga, acuta, undulata, glabra, inferiora digitalia, ſuperiora pollicaria.

Flores in ramis paniculatis racemoſi.

LILIUM *cordifolium*: foliis cordatis.

Hemerocallis cordata. Flor. Japon. p. 143.

Japonice: Sjire, rectius Sjiroi et Osjiroi. Kæmpf. Amœn. Exot. faſc. v. p. 870. Icon. Select. tab. 46.

LILIUM *ſpecioſum*: foliis ſparſis ovato-oblongis, floribus reflexis, corollis revolutis, caule ramoſo.

Lilium ſuperbum. Flor. Japon. p. 134.

Japonice: Kaſbiako, vulgo Konokko Juri, it. Corei Juri. Kæmpf.

Kæmpf. Am. Exot. faſc. v. p. 871. Konokko Juri, Kæmpf. Icon. Select. tab. 47.

LILIUM *lancifolium:* foliis ſparſis lanceolatis, corollis erectis ſubcampanulatis.

Lilium bulbiferum. Flor. Japon. p. 134.

Caulis angulatus, hirſutus, erectus, ſimplex, pedalis et ultra.

Folia alterna, ſeſſilia, lanceolata, glabra, digitalia, ſuperiora ſenſim breviora.

Corollæ parvæ, unguiculares, albæ.

Axillæ foliorum ſuperiorum bulbiferæ.

LILIUM *longiflorum:* foliis ſparſis lanceolatis, corollis tubulato-campanulatis, caule glabro.

Lilium candidum. Flor. Japon. p. 133.

Japonice: Sjire, Sjiroi, Osjiroi et Siro Juri.

Creſcit in Nagaſaki, Miaco, alibi.

Floret Junio.

Caulis teres, noduloſus, glaber, inanis, erectus, bipedalis.

Folia ſparſa, ſeſſilia, lanceolata, integra, glabra, trinervia, baſi adpreſſa, apice recurva, ſeſquipollicaria.

Corollæ albæ, tubulato-campanulatæ, palmares, erectæ.

Differt a *Lilio candido:* 1. foliis baſi latioribus, apice acutioribus, ſtrictioribus, reflexis, non undatis.
2. corolla triplo longiori, cylindrica.

Lilio bulbifero: 1. corolla maxima, alba.
2. caule lævi, tereti.

LILIUM *bulbiferum:* foliis ſparſis lanceolatis, corollis campanulatis erectis, caule villoſo.

Lilium philadelphicum. Flor. Japon. p. 135.

Caulis ſimplex, erectus, glaber, pedalis.

Folia

Folia inferiora ſparſa, ſuperiora terna et ſubquaterna, ſeſſilia, baſi lata, lanceolata, integra, glabra, nervoſa, erecto-ſubimbricata, ſeſquipollicaria.

Corolla terminalis, erecta, petalis lanceolatis erectis.

Differt a *Lilio philadelphico*: 1. foliis baſi latioribus.
2. corollis non revolutis.

LILIUM *maculatum*: foliis ſparſis et verticillatis lanceolatis glabris, corollis campanulatis intus maculatis: limbo reflexo.

Lilium canadenſe. Flor. Japon. p. 135.

Caulis teres, ſtriatus, glaber, ſimplex, inanis, pedalis, ſuperne ſubumbellatus.

Folia ſparſa et verticillata, ſeſſilia, lanceolata, glabra, multinervoſa, erecta, digitalia.

Flores ſubumbellati.

Pedunculi digitales, erecti.

Corolla campanulata limbo reflexo, incarnata intus maculis purpureis plurimis adſperſa.

Differt a *Lilio canadenſe*: foliis baſi latis et corollis minus revolutis.

ALETRIS *farinoſa*: erecta foliis linearibus falcatis glabris, floribus ſpicatis.

Hypoxis ſpicata. Flor. Japon. p. 136.

SCILLA *orientalis*: floribus erectis racemoſis, foliis elliptico-enſiformibus.

Scilla bifolia. Flor. Japon. p. 138.

Folia radicalia plura, inferne attenuata, enſiformia, glabra, ſpithamæa.

Scapus erectus, glaber, bipedalis, ſquamis alternis ſpathaceis.

Flores racemoſi.

HEMEROCALLIS *lancifolia:* foliis lanceolatis ſeptemnerviis.
Hemerocallis japonica. Flor. Japon. p. 142.

HEMEROCALLIS *japonica:* foliis ovatis undulatis multinerviis.
Hemerocallis japonica. Kæmpf. Icon. Select. tab. 11.
Folia radicalia, petiolata, ovata, acuminata, undulata, multinervia, tranſverſim tenuiſſime venoſa, glabra, palmaria.
Petioli alati, membranacei, palmares vel paulo ultra.
Flores ut in *Hem. japonica.*

TETRAGONIA *expanſa:* foliis ſubcordatis ovatis punctatis, floribus axillaribus ſolitariis.
Tetragonia japonica. Flor. Japon. p. 208.

TERNSTROEMIA *japonica:* foliis acuminatis exciſis.
Cleyera japonica. Flor. Japon. p. 224.

CORCHORUS *flexuoſus:* foliis duplicato-ſerratis cuſpidatis, caule flexuoſo.
Caulis teres, a foliis decurrentibus ſubangulatus, flexuoſus, glaber, erectus, bipedalis.
Folia alterna, petiolata, oblique cordata, ovata, cuſpidata, duplicato-ſerrata, villoſa, patula, bipollicaria.
Flores in ramis terminales, lutei.

CORCHORUS *ſerratus:* foliis oblongis ſerratis cuſpidatis, ramis glabris.
Caulis erectus, glaber, ramoſus.
Rami teretes, purpurei, glabri, erecti.
Folia alterna, petiolata, oblonga, ſerrata ſerraturis magnis apice ſetaceis, cuſpidata, ſupra tenuiſſime villoſo-ſcabra, ſubtus glabra, bipollicaria, patula.

CORCHORUS *ſcandens:* foliis ovatis ſetaceo-ſerratis oppoſitis, caule ramiſque flexuoſo-ſcandentibus.

Caulis

Caulis teres, scandens, ramosus.
Rami oppositi, similes, divaricati.
Folia opposita, brevissime petiolata, basi rotundata, ovata, acuminata, serrata serraturis setigeris, pollicaria.
Flos in ramulis terminalis, solitarius, flavus.

MIMOSA *speciosa:* inermis foliis bipinnatis: pinnis oblongis glabris, glandula supra costæ basin. *Linn. Syst.* xiv. p. 915.
Mimosa arborea. Flor. Japon. p. 229. Kæmpf. Icon. Select. tab. 19.
Legumina compressa, glabra, juniora villosa.

BEGONIA *grandis:* foliis inæqualiter serratis glabris, caule angulato.
Begonia obliqua. Flor. Japon. p. 231. Kæmpf. Icon. Select. tab. 20.
Begonia grandis. Dryander Act. Soc. Linn. Lond. vol. I. p. 163.

MAGNOLIA *obovata:* foliis obovatis subtus parallelo-nervosis reticulatis.
Magnolia glauca. Flor. Japon. p. 236.
Japonice: Mokkwurèn. Kæmpf. Am. Exot. fasc. v. p. 845. Icon. Select. tab. 43 et 44. it. Fo no ki.
Folia obovato-oblonga, integra, glabra; subtus parallelo-nervosa et tenuissime reticulata nervis villosis, palmaria usque pedalia.

MAGNOLIA *tomentosa:* foliis ellipticis subtus tomentosis.
Magnolia glauca. Flor. Japon. p. 236.
Japonice: Mitsmata; item Kobus. Kæmpf. Icon. Sel. tab. 42.
Folia elliptico-lanceolata, acuta, petiolata, integra, supra glabra, subtus sericeo-tomentosa, palmaria.
Pedunculi breves, reflexi, sulcati, crassi, tomentosi.

CLEMATIS

CLEMATIS *paniculata*: foliis quinato-pinnatis: foliolis cordatis ovatis integris.

Clematis crispa. Flor. Japon. p. 239.

Japonice: Ikaliso.

Caulis flexuosus, scandens, striatus, glaber.

Rami alterni.

Folia petiolata, pinnato-quinata: *foliola* petiolata, cordata, ovata, acuta, indivisa, integra, glabra, inferiora majora, superiora minora.

Petioli flexuosi.

Flores axillares, albi.

Pedunculi triternato-paniculati, filiformes.

CLEMATIS *trifoliata*: foliis oppositis ternatis glabris: foliolis ovatis repando-dentatis, caule scandente.

Scandens foliis ternatis. Flor. Japon. p. 357. N° 43.

THALICTRUM *japonicum*: seminibus lævibus, foliis tripinnatis: pinnulis incisis serratis.

Didynamista Salviæ similis. Flor. Japon. p. 364. N° 74.

RANUNCULUS *japonicus*: foliis inciso-ternatis: lobis incisis dentatis, cauleque hirsuto.

Ranunculus asiaticus. Flor. Japon. p. 241.

Folia radicalia rotundata, suprema fissa, laciniis lanceolatis, omnia trifida laciniis iterum incisis, dentata, acuta, utrinque hirsuta.

Petioli pollicares usque pedales, hirsuti.

Caules striati, hirsuti, vix folioси, flexuosi, apice ramosi in pedúnculos.

ARUM *ringens*: acaule foliis ternatis, spatha galeata receptaculo longiore.

Arum triphyllum. Flor. Japon. p. 233.
Folia ternata, omnino ut in aro triphyllo; sed cuspidata.
Spatha galeata, ringens, cuspidata, spadice seu receptaculo longior, glabra, purpurascens, digitalis.
Receptaculum basi crassum, inde teres, incurvatum, album.

ARUM *serratum*: acaule foliis radicatis ternato-pinnatis: foliolis serratis, receptaculo spatha breviore.
Folia vaginantia, radicalia, bina, ternata: foliolum intermedium solitarium, petiolatum; lateralia pedato-pinnata; omnia oblonga, acuminata, serrata, glabra.
Spatha receptaculo clavato duplo fere longior, acuminata.

MELITTIS *japonica*: foliis alternis ovatis obtusis inæqualiter serratis, calyce villoso.
Melittis melissophyllum. Flor. Japon. p. 248.
Caulis erectus, villosus, simplex, spithamæus.
Folia alterna, petiolata, ovata, obtusa, inæqualiter et duplicato serrata, villosa, patula, digitalia.
Petioli unguiculares.
Flores pedunculati, in axillis foliorum solitarii.
Pedunculis hirtus, pollicaris.
Calyces strigoso-hirsuti, cernui.

OCYMUM *scabrum*: racemis simplicibus erectis, foliis ovatis subtus punctatis.
Ocymum punctatum. Flor. Japon. p. 249.

JUSTICIA *crinita*: pedunculo axillari solitario subquadrifloro, bracteis oblongis ciliatis.
Dianthera japonica. Flor. Japon. p. 21.

JUSTICIA *lancea*: floribus verticillato-aggregatis, foliis integris lanceolatis.

Radix

Radix fibroſa, annua.

Caulis herbaceus, erectus, tetragonus, uti tota planta tenuiſſime pubeſcens, ramoſus, ſubpedalis.

Rami in inferiori parte ſimiles, ſimplices, patuli, breves.

Folia petiolata, inferiora ovato-oblonga, ſuperiora lanceolata, acutiuſcula, integra, patula, pollicaria et ultra.

Petioli breviſſimi, amplexicaules.

Flores in axillis verticillati, ſubſeſſiles, ſemper plures aggregati.

Bracteæ et *calyces* apice piliferæ.

CARDAMINE *ſcutata:* foliis ternatis ſcutatis criſpis, caule ſubnudo.
Cardamine trifolia. Flor. Japon. p. 260.

JUNIPERUS *bermudiana:*
Juniperus barbadenſis. Flor. Japon. p. 264.

JUNIPERUS *barbadenſis:* foliis omnibus quadrifariam imbricatis: junioribus ovatis; ſenioribus acutis.
Juniperus virginica. Flor. Japon. p. 264.

DOLICHOS *umbellatus:* volubilis leguminibus ſubcylindricis rectis glabris.
Dolichos unguiculatus. Flor. Japon. p. 279.
Caulis volubilis, ſtriatus, villoſus.
Folia petiolata, ternata: foliola ovata, acuminata, integra, villoſa; lateralia brevius, terminale longius petiolata, palmaria.
Flores ſubumbellato-racemoſi, pedunculis petiolis longiores, flexuoſi, palmares.
Legumina cylindrica, recta, glabra, pollicaria et ultra.

DOLICHOS *hirſutus:* volubilis leguminibus compreſſis hirſutis, foliolis exterioribus bilobis.
Japonice: Kudſu; it. Kadſune. Kæmpf. Icon. Select. tab. 41.

Caulis volubilis tomentosus.

Folia petiolata, ternata: foliola lateralia breviſſime petiolata, biloba, ſubrotunda lobis mucronatis, ſubtus pallida, reticulata, utrinque tenuiſſime villoſa, palmaria, intermedium petiolatum, indiviſum, majus. *Petiolus* communis ſpithamæus, intermedii folioli pollicaris.

Flores racemoſi, plurimi, purpurei.

Racemus ſenſim florens, ſpithamæus vel ultra.

Pedunculi tomentoſi, unguiculares.

Legumina linearia, compreſſa, hirſuta villo longo flaveſcente, cuſpidata ſtylo curvo perſiſtente, digitalia.

Differt a D. *uncinato*: foliis lobatis, caule tomentoſo, leguminibus compreſſis.

DOLICHOS *cultratus*: leguminibus cultratis dorſo carinatis, caule flexuoſo.

Dolichos enſiformis. Flor. Japon. p. 279. Kæmpf. Icon. Sel. tab. 25.

GLYCINE *javanica*: foliis ternatis, caule villoſo, petiolis hirtis, bracteis lanceolatis minutis.

Glycine javanica. Linn. Syſt. Veg. xiv. p. 659.

Japonice: Fajo Mame.

Creſcit propè Nagaſaki.

Floret Septembri, Octobri.

PICRIS *flexuoſa*: perianthiis hiſpidis, foliis dentatis cordato-amplexicaulibus, caule ſulcato hiſpido.

Caulis ſulcato-angulatus, flexuoſus, ſetaceo-hiſpidus, ſuperne ramoſus, erectiuſculus, vix pedalis.

Folia alterna, omnia ſeſſili-amplexicaulia, ſubcordata, oblonga, villoſo-ſcabra, inferiora digitalia, ſuperiora ſenſim minora.

Flores

Flores in ramis terminales, ſolitarii.
Pedunculi ſeu rami alterni, ſimplices, hiſpidi.
Calyx duplex, hiſpidus, inferior reflexus.
Corollæ luteæ, pappo albo plumoſo.

POLYPODIUM *enſatum:* fronde elliptico-enſiformi, glabra, integra, fructificationibus ſparſis.
Polypodium phyllitis. Flor. Japon. p. 335.
Frons elliptico-enſiformis, acuminata, integra, erecta, glabra, ſpithamæa uſque pedalis.
Fructificationis puncta ſparſa, ſolitaria juxta coſtam mediam in apice, duo vel plura inter nervos in medio, orbiculata.

POLYPODIUM *ſophoroides:* frondibus pinnatis: pinnis enſiformibus inciſo-ſerratis, ſerraturis ſemiovatis nervoſis, infima ſerratura ſuperne longiori.
Polypodium unitum. Flor. Japon. p. 336.
Frons pedalis vel ultra, pinnata, glabra: *Pinnæ* lanceolatæ, acutæ, inciſo-ſerratæ; ſerraturæ ovatæ, parallelo-nervoſæ, mucronatæ, ſæpe a marginibus revolutis ſubfalcatæ; ſerratura infima in baſi a latere ſuperiori longior. *Pinna* terminalis ſimplex, inciſo-ſerrata. *Puncta* fructificantia juxta margines inciſurarum.
Differt a P. *unito*, cui valde ſimilis: pinnula vel ſerratura baſeos pinnarum a latere ſuperiori longiori.

DICKSONIA *ſtrigoſa:* frondibus bipinnatis: pinnulis rhombeis piloſis ſerratis, fructificationibus ſolitariis.
Trichomanes ſtrigoſum. Flor. Japon. p. 339.

CAENOPTERIS *japonica:* frondibus ſupradecompoſitis: pinnulis inciſo-trifidis acutis.
Trichomanes japonicum. Flor. Japon. p. 340.

ASPLE-

ASPLENIUM *incisum*: frondibus pinnatis: pinnis subrotundi incisis serratis.

Asplenium trichomanes. Flor. Japon. p. 334.

Frondes è radice plures, erectiusculi vel diffusi, pinnati, glabri, digitales et ultra. *Pinnæ* subsessiles, alternæ, subrotundæ, dentato-serratæ; inferiores incisæ, subtrilobæ; semiunguiculares, supremi minores.

XXXV. *De-*

XXXV. *Description of Sagina cerastoides, a new British Plant discovered in Scotland by Mr. James Dickson, F. L. S. By the President.*

Read Nov. 5, 1793.

SAGINA CERASTOIDES.

S. *caule diffuso dichotomo, foliis spatulatis obovatisve recurvis, pedunculis fructiferis reflexis.*

Habitat in arenosis maritimis et fissuris rupium, in Bodotriæ insulis. Junio, Julio. ⊙ ?

Herba facie Cerastii, sed floribus semper quadrifidis.

Radix fibrosa, annua ut videtur.

Caules plurimi, diffusi, spithamæi, teretes, folioси; basi attenuati, glabriusculi, alternatim ramosi; supernè magis pubescentes, dichotomi, geniculis tumidiusculis, pallidis, ramulis divaricatis.

Folia opposita, patenti-recurva, integerrima, acuta, mollia, utrinque pubescentia; subtus pallidiora atque nitidiora, venulis rectis, longitudinalibus; inferiora spatulata, longiùs petiolata; superiora obovata, sessilia; summa ovata. *Stipulæ* nullæ.

Flores

Flores è dichotomiâ caulis, ſolitarii, primo ſubſeſſiles, ſtatim pedunculati; *pedunculis* uncialibus, filiformibus, pubeſcentibus; fructiferis reflexis.

Calyx è foliolis quatuor, parum patentibus, lanceolatis, acutis, concavis, baſi obtusè carinatis, extùs pubeſcentibus, intùs lucidis; quorum duo oppoſita anguſtiora ſunt, margineque membranacea.

Petala quatuor, calyce ferè duplo breviora, cuneiformia, alba, tenuiſſima, apice bifida, lobis acutis, rectis.

Stamina quatuor, æqualia, petalis alternantia parumque breviora. *Filamenta* capillaria, alba. *Antheræ* parvæ, ſubrotundæ, luteolæ.

Piſtillum. *Germen* ovatum, longitudine ſtaminum, pallidè vireſcens, glabrum. *Styli* quatuor, breviſſimi, erecti. *Stigmata* recurva, villoſa, alba.

Capſula cylindrica, longitudine calycis, aureo nitens, apice deciſcens denticulis octo, triangularibus, obtuſiſſimis.

Semina numeroſa, luteo-fuſca, ſubcuneiformia, depreſſa, baſi emarginata, margine ſcabriuſcula.

THIS plant was firſt diſcovered by Mr. Dickſon on the rocky and ſandy ſhores of Inch-Keith and Inch-Combe in the Firth of Forth, as well as on the beach below Preſtonpans. Its habit is altogether that of a *Ceraſtium*, moſt nearly reſembling C. *ſemidecandrum*, *pentandrum* and *vulgatum*. But its flowers being conſtantly

conſtantly quadrifid, oblige us to refer it to the genus of *Sagina*, with which they exactly agree; more eſpecially as the genera in this natural order are ſcarcely to be diſcriminated without taking into conſideration the comparative number of the parts of fructification.

The flowers are ſcarcely to be found expanded except in a ſunny afternoon.

XXXVI. *An Account of two new Genera of Plants from New South Wales, preſented to the Linnean Society by Mr. Thomas Hoy, F. L. S. and Mr. John Fairbairn, F. L. S. By the Preſident.*

Read Nov. 5, 1793.

GOODENIA.

Pentandria Monogynia. *Fl. monopetali, ſuperi.*

CHAR. GEN. *Capſ.* bilocularis, bivalvis, polyſperma; diſſepimento parallelo. *Semina* imbricata.

Corolla ſupra longitudinaliter fiſſa, genitalia exſerens; limbo quinquefido, ſecundo.

Antheræ lineares, imberbes.

Stigma urceolatum, ciliatum.

THIS genus belongs to the order of *Campanulaceæ* of M. de Juſſieu, the firſt ſection, *Antheris diſtinctis*, and ought to be there inſerted between *Cyphia* and *Scævola*, and in the Linnean Syſtem between the latter and *Cinchona*.

It differs eſſentially from *Scævola* in its fruit, from *Cyphia* in its corolla, and from *Lobelia* in its ſtamina.

I have given to this new and moſt diſtinct genus the name of *Goodenia*, in honour of my worthy friend the Rev. Dr. Goodenough, treaſurer of this Society, of whoſe botanical merits it would be ſuper-

ſuperfluous to ſay any thing in a volume which contains his Diſſertation on the Britiſh ſpecies of *Carex*. In the conſtruction of this name I have followed the example of Tournefort, who formed *Gundelia* from Gundelſcheimer, a word (like Goodenough) too long to be retained entire in a generic name.

I am poſſeſſed of eight very diſtinct ſpecies of this genus, of which I ſhall give the ſpecific characters, more particularly deſcribing the firſt, for which we are obliged to Mr. Hoy, who has it alive in Sion Gardens.

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1. GOODENIA *ovata*.

G. foliis ovatis denticulato-ſerratis corolliſque glabris, fructu lineari.
Oval yellow Goodenia.

Stem ſhrubby, erect, angular, branched, leafy.

Leaves alternate, on footſtalks, without ſtipulæ, ovate, varying a little in breadth, acute, ſerrated with fine, ſharp, ſpreading, rather unequal teeth, of a bright green, veiny, ſmooth on both ſides, paler beneath. *Footſtalks* channelled above, with a tuft of down in their axillæ.

Flowers yellow, from 3 to 5 in a dichotomous panicle, ariſing ſolitary from each axilla of the uppermoſt leaves, and above half as long as the correſponding leaf. *Footſtalks* ſomewhat angular, ſmooth, with 2 ſubulate bracteæ at each ſubdiviſion.

Calyx of 5 equal, ſubulate, erect, ſmooth leaves, permanent.

Corolla tubular, the *tube* cloven on the upper ſide from top to bottom, ſmooth, greeniſh and ſtriated externally. *Limb* in 5 equal, obovate ſegments, all directed forwards, yellow, membranous,

branous, with a thick greeniſh plait running from the tube to the point of each behind.

Stamina 5, ſhorter than the tube, and projecting through its fiſſure. *Filaments* inſerted into the receptacle, equal, perfectly diſtinct. *Antheræ* nearly linear, vertical, two-celled.

Piſtillum. *Germen* inferior, long, ſlender, ſmooth, with 5 angles. *Style* ſimple, ſomewhat longer than the ſtamina and ſtanding out with them, ſmooth. *Stigma* large, cup-ſhaped, bent down towards the ſtamina, finely ciliated on the margin.

Capſule oblong, crowned with the calyx, two-celled, and of two valves, which burſt at the top, and then become revolute, the partition, which is parallel to them, remaining erect. *Seeds*, ſeveral in each cell, imbricated, lenticular, roughiſh, encircled with a groove.

This plant was preſented to the Society by Mr. Hoy in flower December 4, 1792.

A figure of it exiſts among the hitherto unpubliſhed plates of Sir Joſeph Banks.

2. G. *albida*.

G. foliis obovatis dentatis corolliſque glabris, ſtylo cauleque piloſo. *White-flowered Goodenia.*

For ſpecimens of this and all the following, except G. *paniculata*, I am obliged to John White, Eſq. ſurgeon at Port Jackſon, who gathered them wild in that country.

3. G. *paniculata*.

G. foliis obovato-lanceolatis dentatis corolliſque piloſis, caule nudiuſculo paniculato.

Panicled yellow Goodenia.

Gathered at Port Jackſon by Mr. David Burton. *H. Bankſ.*

4. G. *bel-*

4. G. *bellidifolia.*

G. foliis obovatis denticulatis carnoſis, caule nudiuſculo ſpicato, corolla extus hirſuta, fructu quadrivalvi.

Daiſy-leaved yellow Goodenia.

5. G. *ſtricta.*

G. foliis lanceolatis integris dentatiſve carnoſis glabris, corolla extus hirſuta, ſtigmate ore contracto.

Rigid blue Goodenia.

This grows naturally in marſhy ground, flowering in October.

6. G. *ramoſiſſima.*

G. foliis lineari-lanceolatis ſubdentatis cauleque hiſpidis, ſtylo apice hirſutiſſimo, corolla extus piloſa.

Branching blue Goodenia.

Flowers in October.

7. G. *heterophylla.*

G. foliis integris dentatis lobatiſve piloſis, fructu ſubrotundo, corolla nudiuſcula.

Various-leaved Goodenia.

8. G. *hederacea.*

G. foliis ſubrotundis integris quinquelobiſve, corolla extus lanata, caule proſtrato.

Trailing Goodenia.

Of the colour of the flowers in this ſpecies and the preceding I have no means of judging.

PLATYLOBIUM.

Diadelphia Decandria. *Stamina omnia connexa.*

CHAR. GEN. *Calyx* campanulatus, quinquefidus, laciniis duobus ſupremis maximis, obtuſis.

Filamenta omnia baſi connexa, latere ſuperiori diſtincta.

Legumen pedicellatum, compreſſum, dorſo alatum, polyſpermum.

THIS genus belongs to the 5th ſection of M. de Juſſieu's order of *Leguminoſæ*, and may be inſerted near *Crotalaria* in the Linnean ſyſtem.

Its name I have deduced from πλατὺς broad, and λοβος a pod.

The two large ſegments of the calyx, and the flat upper margin of the pod, abundantly diſtinguiſh it from all other genera.

We are hitherto acquainted with only one certain ſpecies of this genus, ſeeds and ſpecimens of which have been ſent from New South Wales, and which may juſtly be called

PLATYLOBIUM *formoſum.*

Orange flat-pea.

Stem ſhrubby, four feet high. Branches oppoſite, round, roughiſh, covered with leaves, and ornamented with numerous flowers.

Leaves

Leaves oppoſite, on very ſhort hairy footſtalks, cordato-ovate, entire, revolute, acute, with a minute ſpine at the end, very veiny, rigid, of a beautiful green, glaucous beneath. *Stipulæ* in pairs, lanceolate, brown, membranous, ſtriated, ſmooth.

Flowers ſolitary, from the axillæ of the uppermoſt leaves, oppoſite, on ſhort hairy footſtalks. *Bracteæ* ſeveral at the baſe of the footſtalk, ovate, concave, and hairy, and two at the top, immediately under the flower, which are ſomewhat longer.

Calyx very hairy, campanulate, permanent, with 5 teeth; the 3 lowermoſt of which are acute and ſpreading, the 2 uppermoſt very large, obovate, obtuſe, cloſe preſſed to the ſtandard.

Corolla papilionaceous. *Standard* twice as long as the calyx, ſpreading, deeply emarginate, orange-coloured, ſtriated almoſt half way to the edge, with beautifully radiant crimſon lines, from a pale-yellow ſpot at the baſe. *Wings* deep yellow, ſhorter than the ſtandard, ſemi-obovate, with a blunt incurved tooth on the upper ſide at their baſe. *Keel* of 2 adhering petals, obtuſe, as long as the wings, whitiſh tipped with a rich crimſon, and furniſhed on each ſide of the baſe with a tooth embraced by the incurved teeth of the wings.

Stamina in one ſet, ſeparated only on the upper ſide, and cloven nearly half their length into ten equal filaments, which are curved upwards. *Antheræ* 10, nearly orbicular, equal, verſatile.

Piſtillum. *Germen* linear, very hairy. *Style* incurved, ſmooth. *Stigma* ſimple, ſharp.

Pod

Pod about an inch and a half long and half as broad, on a ſhort footſtalk, clothed with ſcattered hairs, ſomewhat ſcimetar-ſhaped, perfectly compreſſed, obtuſe, with a ſmall point, of one cell, and extended into a flat border along the upper edge, conſiderably beyond the inſertion of the ſeeds. *Seeds* 7 or 8, black, compreſſed, each ſtanding on a curved white pedicle.

This ſhrub blooms abundantly in its native country all the year through. It has likewiſe flowered in ſeveral gardens in England. Mr. Fairbairn preſented a living ſpecimen to the Society laſt ſummer.

A figure of this beautiful plant will ſoon be given in the work I have undertaken on the *botany* of *New Holland*.

XXXVII. Ex-

XXXVII. Extracts *from the* Minute Book *of the Linnean Society.*

June 1, 1790. The President read a letter from Aylmer Bourke Lambert, Esq. F. L. S. giving an account of *Andromeda Daboecii* and *Saxifraga umbrosa* growing wild in the west of Ireland; the latter on a hill called Crow Patrick, in the county of Mayo, the former on several other mountains in that county.

Jan. 4, 1791.—The Rev. Dr. Goodenough exhibited a specimen of the Soland Goose, *Pelecanus Bassanus*, recently shot on the coast of Sussex.

July 5.—The Rev. Mr. Martyn communicated the following extract of a letter from Miss Anne Welch of Ardenham hill near Aylesbury.

" In the year 1788 I removed several plants from Hampstead to " a garden I was then making near Aylesbury. The soil consisted " of deep clay manured with pond mud, sand, and dung in some " parts; in others it was a compost formed of the ruins of build- " ings, and lime-stone, mixed with a mould produced from a " variety of animal and vegetable substances. This compost " varied in depth, quality, and number of materials.

" My plants were firſt placed in the clayey ſoil. Amongſt " them was the *Hemerocallis fulva.* I never was poſſeſſed of the " *flava,* till it was produced by accident as follows, from the cul- " ture of the only plant of the *fulva* that grew in my garden. " The ſucceeding year I divided my *Hemeracallis*, and planted part " of it in a ſhallow bed of the compoſt formed from the ruins, " &c. taking care to move it with a large ball of earth at the " roots, which ſhot very freely, ſo that I was able to take off " another part of the plant, and the ſame ſummer I placed that " in the ſame bed. When the laſt plant flowered, I was agreeably " ſurpriſed with the ſight of an *Hemerocallis flava.* Laſt year I " had theſe plants varying in ſize and colour, large and of a deep " tawny hue; ſmall and abſolutely yellow; and alſo of a pale " tawny, and of a ſize between the *fulva* and *flava.*"

This communication was accompanied by ſpecimens of the above-mentioned varieties.

Dec. 6.—The following miſcellaneous remarks from Mr. James Hoy (now F. L. S.) were read.

" Juncus articulatus β *Linn. Flo. Suec.* 113, mentioned alſo in " *Lightf. Flo. Scot.* 185, ſuppoſed by the former to be a viviparous " variety, and by the latter to be a diſeaſe occaſioned by an inſect " of the *Coccus* tribe, appears to be occaſioned by the *Chermes gra-* " *minis.* For many years paſt I have noticed this appearance, " but without any ſatisfaction till September laſt, when among " ſeveral plants of that kind which came in my way in the courſe " of a week, I picked up one upon which I found ſome inſects " that appeared to be the *larvæ* of a *Chermes*, as they were covered

over

" over with the downy cotton-like ſubſtance, which characterizes " moſt of that genus. Upon other ſpecimens gathered about the " ſame time and kept in water the ſame inſects appeared in a " day or two. At length ſome of them having diveſted them- " ſelves of their exuviæ, were found to agree with Linnæus's de- " ſcription of his *Chermes graminis*. This ſpecies is ſaid by him " to live on the *Aira flexuoſa*, on which I have not yet found it, " though I ſearched for it particularly when theſe inſects were " moſt plentiful upon the above *Juncus*.

" There is no doubt therefore that the *Chermes graminis* lives upon " the plant in queſtion, and is the cauſe of its producing theſe " leafy *utriculi* inſtead of ſtalks and flowers. In the ſame manner the " *Chermes abietis* cauſes the tubercles found on ſome branches of the " ſpruce fir inſtead of young ſhoots and leaves; and as the trees " upon which theſe tubercles are found are not, upon that ac- " count, reckoned varieties of the ſpruce fir, ſo the plants that have " ſome, or even the whole, of their ſtalks and leaves contracted " into ſhort bunches, ought not to be conſidered as varieties of the " *Juncus articulatus*."

— — —

" Mr. Lightfoot mentions in the *Flora Scotica* that he does not " remember to have found the *Agaricus delicioſus* in Britain. It " grows however plentifully in the fir plantations here, about the " beginning of October, and will therefore it is hoped have a place " in every future *Flora Scotica**."

* Dr. Smith, P. L. S. found this *Agaricus* in Rivelſtone wood near Edinburgh, 1782, and on the Marchioneſs of Rockingham's lawn at Hillingdon, Middleſex, under ſome fir trees, in Oct. 1793. Mr. Hudſon mentions it as growing near Guildford.

"It is a general character of deer, that the females of every "ſpecies except the rein deer, are deſtitute of horns. A ſingular in- "ſtance to the contrary occurred here in September laſt. A hind, "the female of *Cervus Elaphus*, was ſhot by the Duke of Gordon, "which had one horn perfectly ſimilar to that of a ſtag three "years old. It had never had a horn on the other ſide of its "head, for there the correſponding place was covered over by "the ſkin, and quite ſmooth. It did not ſeem to have ever pro- "duced a fawn, and upon diſſection, the ovarium *on the ſame ſide* "*with the horn was found to be ſchirrous.*"

April 3, 1792.—Mr. Teeſdale, F. L. S. preſented a wild ſpecimen of *Eriophorum alpinum* found in Scotland, though not before known to be a Britiſh plant.

Nov. 6.—A wild ſpecimen of *Pyrola uniflora*, found plentifully in the fir woods near Brodie-houſe, in the county of Moray, Scotland, was ſent by Mr. James Hoy, F. L. S.

The Preſident *read part of a letter from Dr. Swartz, F. M. L. S. dated Oct.* 4, 1792, *as follows.*

"I am ſorry for the fault in the characteriſing of *Canella alba* "(Tranſ. of L. Soc. vol. i. p. 100). Notwithſtanding num- "berleſs obſervations on the fruit, I found too late that I had "been deceived. Indeed moſt plants require repeated obſerva- "tions before they can be fully known. The germen has three "cells. It is true, however, that in the ripe fruit one cell only con- "tains ſeeds, the rudiments of the other two being rarely to be ſeen."

Jan.

Jan. 8, 1793.—The Preſident preſented a ſpecimen of *Convallaria verticillata*, a new Britiſh plant, gathered in the Den Rechip, a deep wooded gulley, from the hills in the Stormont, Perthſhire, about four miles north-eaſt of Dunkeld, by Arthur Bruce, Eſq. Secretary to the Nat. Hiſt. Society of Edinburgh.

Feb. 5.—The Rev. Mr. Hugh Davies, F. L. S. communicated drawings of the *Cancer Bufo*, Herbſt. t. 17. f. 95, and the *Phalangium groſſipes*, Linn. both caught on the ſea coaſt of Angleſea.

May 7.—The Preſident preſented a ſpecimen of *Trifolium ſuffocatum*, found wild on the ſands about Yarmouth, by Mr. Lilly Wigg, A. L. S.

F I N I S.

Dr. GOODENOUGH wiſhes to alter ſome erroneous paſſages in his paper, and to add the following note.

Page 133, line 9, for *them*, read *themſelves*.

Page 140, line 14, ſtrike out the words *ſæpius ſub-diſtichæ*, which was an error in tranſcribing.

In pages 137 and 169, *Carex ſtrigoſa* ſhould be deſcribed *ſpicis recurvis* inſtead of *pendulis*.

Page 155, line 7 from the bottom, read *complete* for *accurate*.

Page 157, line 13, a ſemicolon ſhould be placed after the word *compoſita*.

Page 189, line 11, the *hyphen* is an error of the preſs.

Page 200, line 13, *auriculatâ* an error of the preſs for *auriculâ*.

There are others of leſs importance which it is needleſs to mention.

Since my Obſervations have been printed, I have received from my friend Mr. Daval, ſpecimens of the *Carex* deſcribed by Scheuchzer p. 497, and figured t. 11. f. 9 and 10. quoted by Linnæus for *C. dioica*. It ſeems a diſtinct ſpecies, and will be the ſubject of conſideration when I come to treat of the foreign Carices. I have alſo received from my friend the Rev. Mr. Williams of Eaton near Shrewſbury, ſpecimens of *C. hirta*, with ſmooth vaginæ—I would therefore wiſh the words *vaginis hinc lanato-villoſis* to be omitted in the ſpecific deſcription—and would beg leave to inſert after the long deſcription—*Planta in aquoſis variat vaginis glabris*.

Explanation *of the* Plates *of Dr.* Goodenough's *Paper on* Carices.

Plate 19.

Fig. 1. *Carex axillaris.*—*N. B.* The long foliaceous bractea, which ſubtends the lowermoſt cluſter of ſpiculæ, is by accident omitted.

2. *Carex diviſa.*—The ſmall figure repreſents the ſpike at its firſt appearance—The large one exhibits it in its more advanced ſtate—Underneath is the germen with its gluma or ſquama.

3. *Carex teretiuſcula.*—The ſmall figure repreſents the ſpike at its early appearance—Underneath it is a tranſverſe ſection of the culm, to ſhew its roundiſhneſs—The larger figure ſhews it in its more advanced ſtate, when the panicle ſeparates a little—The figure does not ſufficiently expreſs the ſupra-decompoſition of the ſpike—Underneath is a capſule, placed ſo as to ſhew the gibboſity of the exterior part.

Plate 20.

4. *Carex ſtrigoſa.*—The ſpikes repreſented as they appear before the ripe ſeeds weigh down their extremities. Underneath is the fructification in its various ſtages, with the glumæ or ſquamæ.

5. *Carex filiformis*—Repreſented in a ſtate of fructification, with the germen, ſtamina and glumæ underneath.

6. *Carex fulva*—In both its early and advanced ſtage—Underneath are the ſtamina and germen with their glumæ—A ripe capſule is added, but the figure does not repreſent it ſufficiently beaked.

Plate 21.

7. *Carex extenſa.*—Both figures are drawn from ſpecimens in their moſt advanced ſtate—Underneath is a ripe capſule, with its gluma or ſquama.

Fig.

FIG. 8. *Carex ſtricta.*—In the figure of the younger plant the leaves, which grow cloſe to the culm and parallel to it, are drawn open to ſhew the reticulated filaments—Underneath are the ſtamina and germen with the ſquamæ.

9. *Carex cæſpitoſa.*—Both ſpecimens in a ſtate of inflorescence—Underneath are the ſtamina and a capſule nearly ripe, with their ſquamæ.

PLATE 22.

10. *Carex rigida*—In both its early and advanced ſtage—Underneath are the ſtamina and germen with their glumæ or ſquamæ—There is added a ripe capſule—It is very ſeldom ſo obtuſe as is repreſented in the figure here given.

N. B. In p. 151, line 17, for *oblongæ ſeſſiles aggregatæ* read *oblongis ſeſſilibus aggregatis.*